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Three Essays on Corporate Governance and Earnings Management

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Introducción

La teoría de agencia ha dominado el análisis del gobierno de la empresa desde Berle y Means (1932). Esta teoría estudia la separación entre propiedad y control, y la posibilidad de que los gerentes (agentes) tomen decisiones en contra de los intereses de los accionistas (principales). Por ejemplo, los ejecutivos pueden acumular beneficios privados construyendo imperios, fijándose salarios desorbitados, realizando transferencias entre empresas afiliadas a precios fuera de mercado, o esforzándose menos de lo necesario.

En este contexto, el gobierno de la empresa está ideado para alinear los intereses de los directivos y los de los accionistas. Un buen gobierno de la empresa es aquel que selecciona los gerentes más capaces y los responsabiliza frente a los inversores. Existen diferentes mecanismos de gobierno que se pueden utilizar para lograr que los gerentes no expropien a los accionistas. Estos mecanismos se clasifican en internos o externos. Los mecanismos internos hacen referencia a la organización interna de la empresa, como la independencia del consejo de administración, la presencia de accionistas mayoritarios, y los mecanismos de remuneración de los directivos. Los mecanismos externos son aquellos que se basan en el control ejercido por el mercado de capitales, como las adquisiciones de empresas y el mercado de capitales.

El gobierno de la empresa usa estados financieros (estados contables) como parte del sistema de información. A través de los estados financieros, los accionistas son capaces de evaluar el comportamiento de los directivos y pueden confirmar sus expectativas sobre los resultados de la gestión de los ejecutivos. Si las expectativas sobre el trabajo realizado por los directivos son desatendidas, los accionistas pueden tomar medidas disciplinarias que afecten al bienestar de los gerentes en términos de desarrollo de su carrera profesional, de remuneración, o de reputación.

Dado el papel fundamental de la información contable para disciplinar el comportamiento de los gerentes, no es sorprendente que éstos traten de manipular los estados financieros para lograr sus propios beneficios, a la vez que tratan de satisfacer a los accionistas. De esta manera, los ejecutivos lograrían comportarse de forma oportunista y, a la vez, satisfacer las expectativas de los accionistas, al menos sobre el papel. En esta tesis, se estudian diferentes maneras a través de las cuales los gerentes pueden distorsionar la información de los estados financieros. En primer lugar, los ejecutivos pueden alisar los beneficios eligiendo de manera oportunista el momento de reconocimiento de ingresos y gastos. En segundo lugar, se considera el uso oportunista de los devengos, que se basan en supuestos y estimaciones que se pueden aplicar de manera oportunista para confundir a los usuarios de los estados financieros. Por último, se estudia la manipulación de las actividades reales, que afecta el curso normal de las operaciones de empresa. Por ejemplo, para crear un volumen adicional de ventas, los ejecutivos pueden ofrecer condiciones de crédito más favorables al final del año fiscal.

En los tres capítulos centrales de esta tesis, se estudia cómo el gobierno de la empresa, en lugar de reducir el problema de agencia alineando los intereses de los directivos con los de los accionistas, puede amplificar el problema llevando a los ejecutivos a manipular la información contable. En el primer capítulo, titulado "Overinvestment, subsequent earnings management, and CEO vulnerability", se analiza un ejemplo clásico de acciones tomadas por los gerentes en contra de los intereses de los accionistas: las ineficiencias de inversión. Una inversión es eficiente y debe llevarse a cabo cuando su valor actual neto es positivo. En ocasiones, los gerentes prefieren sobreinvertir, es decir, invertir más allá del nivel óptimo, en contra de los objetivos de los accionistas. Aunque la información contable ayuda a las partes interesadas a supervisar la gestión y el rendimiento de las inversiones, en este capítulo se argumenta que los ejecutivos invierten demasiado y

esconden esta ineficiencia a los accionistas mediante la introducción de sesgos en la información contable a través de los devengos y de la manipulación de ventas. También se analizan los objetivos particulares que los gerentes pueden conseguir sobreinvirtiendo de forma oportunista. Debido a que el exceso de inversión hace que el reemplazo de los gerentes sea más costoso y que la empresa sea menos atractiva para una potencial adquisición, se plantea la hipótesis que los gerentes que se encuentran en una situación más vulnerable en su puesto de trabajo son más proclives a la sobreinversión para asegurar su puesto de trabajo en el futuro.

El segundo capítulo, titulado "Entrenched managers' usage of earnings management tools", tiene el objetivo de evaluar una manifestación del problema de agencia: el atrincheramiento de los gerentes. El atrincheramiento tiene lugar cuando los gerentes maximizan su bienestar personal sin experimentar la disciplina del gobierno corporativo y de los mecanismos de control. Los gerentes se pueden atrincherar de distintas formas, como a través de mecanismos que limitan la posibilidad de que la empresa sea adquirida por un tercero. El atrincheramiento de los gerentes se ha considerado en la literatura sobre el gobierno de la empresa como una de las manifestaciones más costosas del problema de agencia, ya que reduce la probabilidad de ofertas públicas de adquisición (OPAs) hostiles y conduce a una asignación ineficiente de los recursos de la empresa. Sin embargo, en la tesis se sostiene que el atrincheramiento reduce la "miopía" de los gerentes. Cuando los gerentes están sujetos a la presión del mercado de capitales, tienden a centrarse en el rendimiento a corto plazo, más que en inversiones de mayor riesgo con rendimiento a largo plazo. Por el contrario, los gerentes atrincherados sienten menor presión por parte de los mercados de capital y, por ello, pueden dirigir su atención hacia objetivos a largo plazo. Por esta razón, se propone que los ejecutivos atrincherados son menos proclives a distorsionar la información contable a través de los devengos y de la manipulación de actividades reales,

que normalmente se utilizan para lograr objetivos a corto plazo a costa de los objetivos a largo plazo. Por otra parte, dado que el alisamiento de los beneficios se puede utilizar para satisfacer objetivos a largo plazo, como una disminución del coste de capital y del coste de la deuda, en este capítulo se prevé que los gerentes atrincherados tienden a alisar los beneficios. Finalmente, debido a que los gerentes atrincherados son los que menos distorsionan la información contable a través de los devengos y de la manipulación de actividades reales, que son perjudiciales para el rendimiento operativo futuro de la empresa, se espera que el atrincheramiento tenga una asociación positiva con los resultados operativos de la empresa en los siguientes años.

En el tercer capítulo, titulado "Compensation mechanisms, accounting choice, and real activities manipulation", se analiza cómo los mecanismos de compensación, inicialmente introducidos para resolver el conflicto de agencia entre gerente y accionista, y que normalmente vinculan la remuneración del gerente a los resultados de empresa, pueden tener el efecto contrario, amplificando los problemas de agencia. Aunque estudios anteriores ya se han centrado en la relación entre algunos mecanismos de compensación de los ejecutivos y la calidad de los devengos, en este capítulo se argumenta que los mecanismos de compensación, como las opciones sobre acciones, los bonos anuales, los planes de incentivos a largo plazo, las acciones y las acciones restringidas, tienen características que llevan a los ejecutivos a manipular no sólo las cifras contables (por ejemplo, a través del alisamiento de beneficios y del uso oportunista de los devengos), sino también las actividades reales (es decir, a través de la manipulación de las ventas). Por lo tanto, los mecanismos de compensación pueden ser perjudiciales no sólo para la información contable, sino también para el valor futuro de la empresa, como consecuencia de una reducción en los flujos futuros de caja.

Chapter 1 – Introduction

Agency theory has dominated the analysis of corporate governance since Berle and Means (1932). Its main concern is the separation of ownership and control, and the possibility that managers (agents) take actions that hurt shareholders (principals). Chief Executive Officers (CEOs) may amass private benefits by building empires, maintaining costly labour, paying inflated transfer prices to affiliated companies, or spending insufficient effort in their job.

In this context, corporate governance is expected to align the interests of managers to those of shareholders. Accordingly, a strong corporate governance is "the one that selects the most able managers and makes them accountable to investors" (Tirole, 2001: 2). There are different corporate governance mechanisms that can be used to force agents to internalize the welfare of shareholders. These mechanisms are classified as either internal or external. Internal corporate governance refers to the organization of firms, such as the independence of the board of directors, the presence of blockholders, and the structure of managerial compensation mechanisms. External corporate governance consists in market-based control mechanisms, such as takeovers and the market for corporate control.

Corporate governance uses financial reporting as a part of the corporate information system. Through the information in the financial reports, shareholders are able to assess managers' behavior and to confirm their expectations about the results of managerial choices. If principals' expectations are unattended, shareholders take disciplinary actions that are likely to affect managerial welfare via career concerns, managerial compensation, or managerial reputation.

Given that accounting is used by shareholders to monitor managerial actions, there is evidence that managers manipulate the financial reports to mislead shareholders about

managerial opportunistic behaviors. In this thesis, I consider different ways through which managers may distort accounting information. First, CEOs can engage in income smoothing, which is the process of manipulating the time profile of earnings to make the reported income stream less variable. Second, I consider the opportunistic use of accruals. Accruals are based on assumptions and estimates that can be managed opportunistically to mislead users of financial statements. Finally, I study CEOs' real activities manipulation, which affects the normal course of operational activities. For example, to create additional sales volume, CEOs can offer more lenient credit terms at the end of fiscal year.

In the three empirical essays of this thesis, I analyze CEOs' opportunistic behaviors and how corporate governance, instead of reducing the agency problem by aligning managers' interests with those of shareholders, may amplify it by leading CEOs to manipulate accounting information. In the first essay, titled "Overinvestment, subsequent earnings management, and CEO vulnerability", I analyze a typical manifestation of CEOs' behavior against shareholders' interests: The case of investment inefficiencies. An investment is efficient and should be undertaken when its net present value is greater than zero. Managers are sometimes inclined to overinvest, that is, to invest beyond the optimal level, in contrast with shareholders' objectives. Although financial reporting helps stakeholders to monitor managerial behavior and investment returns, I argue that CEOs overinvest and make shareholders believe they are investing properly by introducing bias into accounting measures through the opportunistic use of accruals and through sales manipulation. I also analyze private objectives that CEOs are likely to achieve by overinvesting opportunistically. Because overinvestment makes managerial replacement more costly and firms less attractive for a potential takeover, I hypothesize that vulnerable managers are likely to overinvest to ensure their job position in the future.

The second essay, titled “Entrenched managers’ usage of earnings management tools”, is aimed at analyzing a manifestation of the agency problem: Managerial entrenchment. Managerial entrenchment can be defined as managers maximizing their personal welfare without experiencing discipline from corporate governance and control mechanisms, for example through the implementation of anti-takeover provisions. CEOs’ entrenchment has been seen in the corporate governance literature as one of the costliest manifestation of the agency problem, as it reduces the probability of takeovers and leads to an inefficient allocation of firm’s resources. However, I argue that managerial entrenchment reduces CEOs’ “myopia”. When managers are subject to the pressure of the capital market, they usually focus on short-term performance, rather than on riskier long-term investments. On the contrary, entrenched CEOs feel less pressure from capital markets and, thus, direct their attention to long-term objectives. For this reason, I argue that entrenched CEOs are less likely to distort financial reporting information through discretionary accruals and real activities manipulation, which are normally used to achieve short-term objectives at the expense of long-term goals. On the other hand, given that income smoothing can be used to satisfy long-term objectives, like a decrease of both cost of equity and cost of debt, I hypothesize that entrenched managers are likely to engage in income smoothing. Finally, because entrenched CEOs are less expected to distort financial reporting through discretionary accruals and real activities manipulation, which are detrimental to future operating performance, I argue that managerial entrenchment is positively related to subsequent firm operating performance.

Finally, in the third essay, titled “Compensation mechanisms, accounting choice, and real activities manipulation”, I analyze managerial compensation mechanisms. Initially, managerial compensation mechanisms were designed to solve the agency conflict between managers and shareholders, as they normally link CEOs’ remuneration to firm

performance. However, these compensation mechanisms may have the opposite effect, amplifying agency problems. Although previous studies have already focused on the relation between some compensation mechanisms and accruals quality, I argue that compensation mechanisms, such as stock options, annual bonuses, long-term incentive plans, equity stocks, and restricted stock grants, have characteristics that lead CEOs to manipulate not only accounting numbers (i.e., through income smoothing and discretionary accruals), but also real activities (i.e., through sales manipulation). As a consequence, compensation mechanisms can be detrimental not only to the informativeness of earnings, but also to future firm value, through a reduction in future cash flows.

Chapter 2 - Overinvestment, Subsequent Earnings Management, and CEO Vulnerability

Abstract

Financial reporting is considered to be a powerful tool at the service of shareholders to limit the problem of overinvestment in which managers may incur to pursue their own interests. In this context, we argue that CEOs that overinvest subsequently distort financial reporting information to keep up with stakeholders' expectations about investment returns. Also, because overinvestment has the effect of both making managerial replacement more costly and decreasing the attractiveness of firms for a potential takeover, we hypothesize that vulnerable CEOs are likely to overinvest to ensure their job position in the future. Results suggest that CEOs' overinvestment is positively associated with earnings management, measured through both discretionary accruals and sales manipulation. Empirical tests also indicate that managers use more intensively discretionary accruals to hide overinvestment to stakeholders if investments are more difficult to be monitored, as in the case of capital expenditures and R&D expenses. Finally, our tests show that less vulnerable CEOs are likely to have engaged in overinvestment in the previous period, suggesting that overinvestment is likely to ensure managerial position in the future.

2.1. Introduction

According to the agency theory, managers are likely to choose actions that maximize their own welfare, rather than shareholders' welfare (Jensen and Meckling, 1976). To avoid CEOs' opportunistic behaviours, stakeholders use financial reporting as a part of the corporate information system (Watts and Zimmerman, 1983; Watts, 2003). Through financial reporting information, stakeholders are able to monitor their expectations about the results of managerial choices. If principals' expectations are unattended, shareholders take disciplinary actions that are likely to affect managerial welfare via career concerns, managerial compensation, or managerial reputation (Watts, 2003).

An example of CEOs' opportunistic behaviour is represented by investment inefficiencies. Managers are sometimes inclined to make investments that are not efficient, that is, that are not able to generate a net present value greater than zero (Jensen and Meckling, 1986). In particular, CEOs tend to overinvest, that is, to invest beyond the optimal level (Shleifer and Visnhy, 1989), either to achieve personal benefits, such as an increase of resources under their control or an increase in their prestige (Stulz, 1990), or because they are overconfident about their abilities (Malmendier and Tate, 2005). Also in the case of overinvestment, financial reporting can play an important role in constraining the opportunistic behaviour of CEOs by helping stakeholders monitor investment returns (Biddle and Hilary, 2006; Verdi, 2006; Biddle et al., 2009; Francis and Martin, 2010). The authors observe that financial reporting quality reduces investment inefficiencies (Biddle and Hilary, 2006; Verdi, 2006; Biddle et al., 2009), and that conservative accounting policies, as part of the corporate control structure, lead CEOs to make more profitable investments, such as acquisitions and divesture decisions (Francis and Martin, 2010).

To avoid a decrease of their welfare, managers can introduce bias into accounting measures. There are different ways to manipulate firm financial performance. One of the most studied ways in previous literature is the unexpected components of accruals (among others, Jones, 1991; Dechow et al., 1998). Accrual accounting is defined as "the accrual and deferral of past, current and anticipated future cash receipts and disbursements" (Richardson et al., 2005: 441). Accruals are subject to assumptions and estimates and can be manipulated to mislead users of financial statements. An opportunistic usage of discretionary accruals has the effect of making earnings less informative, but it also has the effect of decreasing subsequent earnings due to their reversal effect. Another way to distort firm financial information is to manipulate normal operational practices. According to a survey conducted by Graham et al. (2005), executives are willing to burn cash flows

through the manipulation of real activities to meet stakeholders' expectations. Roychowdhury (2006), for example, observes that managers can create additional sales volume by offering more lenient credit terms, such as lower (or even zero) interest rates, at the end of the fiscal year. Sales manipulation leads to lower operating cash flows (CFOs) and, thus, to lower future operating performance. We then expect a positive association between CEOs' overinvestment and both discretionary accruals and sales manipulation to avoid stakeholders realizing investment inefficiencies and, thus, a decrease in managerial welfare.

We also analyze private objectives that CEOs are likely to gain by opportunistically overinvesting. According to Fredrickson et al. (1988), the first years of CEOs' tenure coincide with a period of extreme vulnerability. In fact, new CEOs are closely monitored by boards and stakeholders and they need time to show their competitive advantage inside their firms (Shen, 2003). Such an early vulnerability is reflected in the high number of CEOs whose tenure lasts less than three years (Fredrickson et al., 1988). Overinvestment can help managers to strengthen their positions and, thus, to become less vulnerable in the future. Shleifer and Vishny (1989) argue that managers tend to invest firms' resources in assets that are not value-maximizing for shareholders, but that are able to reduce the probability of managerial replacement. For example, CEOs can overinvest free cash flow in an asset if they represent the best person to run it, even if the value-maximizing choice for shareholders would be distributing free cash flow as dividends (Shleifer and Vishny, 1989). Also, overinvestment is likely to increase current stock price (McConnell and Muscarella, 1985) and to decrease future firm value (Jensen, 1986), making firm less attractive for a potential takeover and, thus, further ensuring managerial job position. Thus, we argue that vulnerable CEOs are likely to overinvest to make their position inside firms less vulnerable in the future.

We test these contentions using a US sample for the period 1992-2006. We collect accounting data from Compustat and corporate governance characteristics from Execucomp. The final sample consists of 6,424 firm-year observations corresponding 1,332 different firms.

We find that overinvesting CEOs are likely to opportunistically use both discretionary accruals and sales manipulation. The magnitude of the positive association between overinvestment and earnings management becomes stronger when we exclude from our definition of investment items that are easy to monitor, such as acquisitions. In fact, if investment returns are difficult to monitor (like in the case of capital expenditures and R&D expenses), it is more effective for managers to mask investment inefficiencies through earnings management. We also show that firms having *ex-ante* conditions to overinvest, such as high cash and low leverage, are still likely to distort financial accounting information through the manipulation of accounting numbers.

Finally, we test whether vulnerable CEOs engage in overinvestment to decrease their vulnerability in the future. By measuring vulnerability through CEO tenure, as longer tenure corresponds to less vulnerability (Fredrickson et al., 1988), results support the idea that overinvestment decreases managerial vulnerability in the future. The tests we conduct are robust to all the proxies of overinvestment used in this paper.

The remainder of the paper is organized as follows: In Section 2, we develop the testable hypotheses. In Section 3 we describe the data, define the variables and present the research methods. Section 4 contains the results. Finally, Section 5 concludes.

2.2. Overinvestment, earnings management, and CEOs' personal objectives

In this section, we develop hypotheses about the associations between overinvestment and both discretionary accruals and sales manipulation. Furthermore, we analyze CEOs'

opportunistic behavior in using overinvestment as a tool to decrease their vulnerability in the future.

2.2.1. Earnings management to cover investment inefficiencies

An investment is efficient and should be undertaken in the interest of shareholders when its net present value is greater than zero. However, "managers have incentives to cause their firms to grow beyond the optimal size" (Jensen, 1986: 323). For example, a CEO with greater experience in the marketing field is more likely to implement further strategies and investments focused on brand developments to make his or her replacement more costly, even if such strategies have a negative net present value (Shleifer and Vishny, 1989). The inefficient use of firm resources can lead to poor selection of investment projects, including financing projects with *ex-ante* negative net present values and, thus, to a disappointment of stakeholders' expectations.

CEOs tend to overinvest, that is, to invest beyond the optimal level, either because they are overconfident about themselves and the return of their investment projects (Malmendier and Tate, 2005; Ben-David et al., 2007; Schrand and Zechman, 2007), or to achieve private objectives, in contrast with stakeholders' interests. For example, by overinvesting, managers increase resources under their control, possibly increasing their prestige (Stulz, 1990), and, eventually, also their compensation (Murphy, 1999).

It is commonly accepted that financial reporting is part of the information system of firms, and that it helps mitigate information asymmetries (e.g., Holmstrom and Tirole, 1993; Bushman and Smith, 2001) as it provides to stakeholders information about managerial investment decisions. Previous literature, for example, observes that higher quality of accounting information leads to better bidding decision in acquisitions (McNichols and Stubben, 2010), and that more detailed geographic disclosure leads to less

aggressive and more profitable growth of firms (Hope and Thomas, 2007). Also, recent literature (Verdi, 2006; Hope and Thomas, 2008; Biddle et al., 2009; Francis and Martin, 2010) argues that higher financial reporting quality is likely to increase investment efficiency due to the enhanced monitoring tool provided to stakeholders.

In this paper, we argue that overinvestment leads to earnings management to cover investment inefficiencies to stakeholders. Given the financial reporting system as source of information, CEOs can still conceal their inefficient investment behavior by engaging in earnings management. We hypothesize that CEOs engaging in overinvestment are likely to engage also in discretionary accruals. As accruals are based on assumptions and estimates, they can be opportunistically managed to mislead users of financial statements (Jones, 1991; Dechow and Dichev, 2002) about CEOs' usage of firms' resources that have not been distributed among shareholders.

To keep up with stakeholders' expectations, not only can CEOs opportunistically use discretionary accruals, but they can also artificially increase sales (Roychowdhury, 2006; Cohen and Zarowin, 2010). For example, sales can be manipulated by offering more lenient credit terms. In this way, sales volume increases, but also credit risk. The effect of sales manipulation is to inflate current earnings. However, it affects future cash flows and, thus, long-term firm value (Roychowdhury, 2006). Our first hypothesis states that CEOs overinvest and, then, distort financial reporting information through both discretionary accruals and sales manipulation.

H1: CEOs engaging in overinvestment are likely to manipulate financial reporting information through both discretionary accruals and sales manipulation.

2.2.2. Overinvestment and CEO vulnerability

Hypothesis 1 suggests that CEOs are willing to engage in overinvestment and to cover it through both discretionary accruals and sales manipulation to achieve private objectives. We argue that CEOs are likely to employ an excessive amount of firm resources to decrease their vulnerability, that is, to decrease the risk perceived by CEOs about their job position.

Investment inefficiencies have an effect both on managerial position inside the firm, and on the market value of the firm (Morck et al., 1990). Shleifer and Vishny (1989) use the example of manager-specific investments to show how excessive investments can consolidate CEOs' position inside firms. Manager-specific investments are those investments that are most valuable under the current manager. If manager-specific investments are also irreversible, they make CEOs' replacement more costly. By using firms' resources to engage in excessive amounts of manager-specific investments, managers "bind shareholders to themselves" (Shleifer and Vishny, 1989: 124).

With regards to the effect that investment inefficiency has on the market value of firms, McConnell and Muscarella (1985) find that stock prices react positively to announcements of greater investment expenditures and negatively to decreased expenditures. However, on the long-run, overinvestment is likely to have negative effects on firm value. Jensen (1986), for example, argues that managers with low debt overhang problem and large free cash flows, which are those that are more likely to overinvest, tend to undertake value-decreasing investments. Also, Stultz (1990) observes that very diversified firms are likely to invest too many resources in poor investment opportunities. Because overinvestment is expected to increase current share value and to decrease future firm value, it decreases firms' attractiveness to a potential buyer and, thus, the probability of takeovers. As a result,

overinvestment is likely to make CEOs less vulnerable. Thus, we expect that CEOs engage in overinvestment to make themselves less vulnerable in the future.

H2: Overinvestment is likely to reduce CEOs' vulnerability in the future.

2.3. Data, variable definitions, and research methods

2.3.1. Data

We collect financial accounting data from the Compustat annual industrial and research files, excluding firms in regulated industries (SIC codes between 4400 and 5000), and financial institutions (SIC codes between 6000 and 6500). We also require that each firm-year observation has the data necessary to calculate investment inefficiencies, discretionary accruals, and sales manipulation. Data about corporate governance characteristics are taken from the Compustat Executive Compensation (ExecuComp) dataset. These data are available only starting from 1992. We winsorize variables at 1% and 99% as it is common to avoid outliers blurring the results. The final sample of US firms consists of 6,424 firm-year observation and of 1,332 different firms from 1992 to 2006.

2.3.2. Earnings management measures

To test the hypothesis about the effects that overinvestment has on manipulation of firm performance, we separately estimate two earnings management tools: Discretionary accruals and sales manipulation.

Discretionary accruals are the firm-specific discretionary portion of total accruals. We construct two proxies to estimate discretionary accruals. As a first proxy, we apply the modified Jones model (Dechow et al., 1995). This model is based on the popular Jones

(1991) model, which estimates total accruals cross-sectionally for all the industry-year combinations as follows:

$$\frac{TACC_{it}}{A_{i,t-1}} = \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \beta_1\left(\frac{\Delta REV_{it}}{A_{i,t-1}}\right) + \beta_2\left(\frac{PPE_{it}}{A_{i,t-1}}\right) + \varepsilon_{it} \quad (1)$$

where $TACC_{it}$ represents total accruals, calculated as the difference between net income before extraordinary items and cash flows from operations (annual Compustat data item #18 – annual Compustat data item #308), A_{it} are total assets (annual Compustat data item #6), ΔREV_{it} is the change in net sales (annual Compustat data item #12), and PPE_{it} is gross property, plant and equipment (annual Compustat data item #7). The estimation is run for all firms in each industry *i* and for each year *t*. In the Jones model, discretionary accruals are the residuals from Equation (1). However, Dechow et al. (1995) observe that the Jones model implies that revenues are non-discretionary. The authors observe that, at the end of the year, managers could use discretion to accrue revenues not only when cash has not been received yet, but also when it is highly questionable whether revenues can be actually realized. In the modified Jones model, Dechow et al. (1995) attempt to eliminate this bias, consisting in measuring discretionary accruals without taking into account the discretion CEOs possibly exercise over revenues. According to this model, once we run Equation (1), we compute the residuals as follows:

$$DA_t = \frac{TACC_{it}}{A_{i,t-1}} - \left[\hat{\alpha}_1\left(\frac{1}{A_{i,t-1}}\right) + \hat{\beta}_1\left(\frac{\Delta REV_{it} - \Delta AR_{it}}{A_{i,t-1}}\right) + \hat{\beta}_2\left(\frac{PPE_{it}}{A_{i,t-1}}\right)\right] \quad (2)$$

The only difference with the Jones model is that changes in revenues are adjusted for the change in accounting receivable (ΔAR_{it}) (annual Compustat data item #2) in the event period. The signed values from the model of Dechow et al. (1995) represent our first proxy for discretionary accruals (*DA1*).

We use an alternative measure of discretionary accruals that controls for firm performance, as it is likely to influence the association between overinvestment and earnings management (Kothari et al., 2005). One means for controlling for the level of firm performance is to expand the determinants of total accruals in Equation (1) by including ROA, computed as the ratio of income before extraordinary items (annual Compustat data item #18) to beginning total assets (annual Compustat data item #6), as a determinant of total accruals. In our tests, we refer to this performance-adjusted discretionary accruals model as *DA2*.

Our proxy for sales manipulation (*SM*) is based on the methodology presented by Dechow et al. (1998) and Roychowdhury (2006). We start from the definition of normal cash flow from operations, which can be considered as a linear function of sales and changes in sales for the current period:

$$\frac{CFO_{it}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \beta_1\left(\frac{S_{it}}{A_{i,t-1}}\right) + \beta_2\left(\frac{S_{it} - S_{i,t-1}}{A_{i,t-1}}\right) + \varepsilon_{it} \qquad (3)$$

where *CFO* is cash flow from operations (annual Compustat data item #308), *A* is total assets (annual Compustat data item #6), and *S* is sales (annual Compustat data item #12). This model is estimated for each year *t* and for every industry classified by its 2-digit SIC code. Roychowdhury (2006) computes her proxy for sales manipulation as the residuals from Equation (3). However, residuals from Equation (3) are also likely to capture the

effects of the manipulation of discretionary expenses, which could be influenced by CEOs engagement in overinvestment. In fact, the portion of overinvestment referred to discretionary expenses has the effect of decreasing current CFOs. To disentangle overinvestment from sales manipulation, we first compute discretionary expenses as the sum of advertising expenses (annual Compustat data item #45), R&D expenses (annual Compustat data item #46), and selling, general, and administrative (SG&A) expenses (annual Compustat data item #189) [1]. We then compute the medians by year and by sector of discretionary expenses divided by beginning total assets and then calculate the difference between the medians and the actual values of discretionary expenses, scaled by beginning total assets. To run Equation (3), we add this difference to CFOs scaled by beginning total assets. Finally, because the smaller the residuals, the higher the manipulation of sales, we multiply the residuals by (-1) for clearer interpretations.

2.3.3. CEO vulnerability measure

We base our proxy for CEO vulnerability on CEO tenure. A reduction of managerial vulnerability inside the firm implies an increase of CEO tenure beyond a level in which managerial position becomes stronger (Shen, 2003). Fredrickson et al. (1988) argue that early vulnerability occurs when CEO tenure is less than, or equal to, three years. After three years, CEOs start gaining power. We then construct a dummy variable taking the value of 1 if CEO tenure is greater than 3, and 0 otherwise.

2.3.4. Overinvestment measures

[1] If SG&A expenses are available, advertinsing and R&D expenses are set equal to zero if missing.

We construct three proxies for overinvestment. First, we estimate investments at time *t* following Richardson (2006) and Verdi (2006). In this model, investments are estimated as follows:

$$Investment\_full_{it} = \beta_0 + \beta_1 Q_{i,t-1} + \varepsilon_{it} \quad (4)$$

The model is computed by year and by sector. As in Verdi (2006), *Investment_full* is the sum of capital expenditures (annual Compustat data item #128), R&D expenditures (annual Compustat data item #46), and acquisitions (annual Compustat data item #129), minus sales of PPE (annual Compustat data item #107) and depreciation and amortization (annual Compustat data item #125), multiplied by 100, and divided by beginning total assets (annual Compustat data item #6). *Q* is Tobin's Q (Tobin, 1982), computed as the ratio of the market value of total assets to the book value of total assets. The market value of total assets is defined as total assets (annual Compustat data item #6), plus the product of stock price (annual Compustat data item #199) and the number of common shares outstanding (annual Compustat data item #25), minus the book value of equity (annual Compustat data item #60), all divided by beginning total assets (annual Compustat data item #6). Then, we compute the residuals (*Inv_efficiency_full*) from Equation (4). Negative residuals represent underinvestment, and positive residuals represent overinvestment. We sort all the residuals (positive and negative) from Equation (4) in quartiles. Finally, we construct a variable (*Overinvestment_full*) that takes the value of 0 if firms have residuals included in the second and third quartile (the benchmark group, representing firms investing at a normal level, compared to other firms in the same year and sector); -1 if firms have residuals that fall in the first quartile (underinvestment group); and 1 if firms have residuals included in the fourth quartile (overinvestment group) (Biddle et al., 2009).

In Equation (4), *Investment_full* includes capital expenditures, R&D expenditures, and acquisitions. Among these three items, acquisitions represent the expenditure that provides more verifiable results. We expect that, by including in the definition of *Investment* only capital expenditures and R&D expenditures (*Investment_partial*), the association between overinvestment and earnings management becomes stronger. In fact, both capital expenditures and R&D expenses are difficult to be monitored. As they are less verifiable, CEOs can more easily mask the correspondent investment inefficiencies through earnings management. Thus, the second overinvestment proxy (*Overinvestment_partial*) is a discrete variable that takes the values from (-1) to 1, depending on the residuals from investment levels, defined without considering acquisitions.

The last proxy of overinvestment is based on *ex-ante* firm-specific characteristics that make managers more likely to engage in overinvestment. Following Biddle et al. (2009), firms with high cash balance and low leverage have more available liquidity and less financial constrains. These characteristics make overinvestment an available option. We first rank firms into deciles of both cash balance, defined as cash and marketable securities (annual Compustat data item #162), over total assets (annual Compustat data item #6) less cash and marketable securities (Opler et al., 1999; Biddle et al., 2009), and the reciprocal of leverage, computed as the ratio between total liabilities (annual Compustat data item #181) and total assets (annual Compustat data item #6). Then, we re-scale the deciles from 0 to 1, and construct a composite measure (*Overfirm*) that is the average of the re-scaled ranked values. The proxy *Overfirm* can take a value from 0 to 1.

2.3.5. Control variables

To control for the effects that internal corporate governance is likely to have on both earnings management and CEO vulnerability, we construct a composite measure that takes

into account three corporate governance characteristics: Board independence, number of board meetings, and CEO duality. More independent boards are positively associated to performance of bidding firms in successful tender offers (Byrd and Hickman, 1992) and to the frequency of boards' decisions to remove CEOs (Weisbach, 1988). We proxy for board independence by using a dummy variable that takes the value of 1 if the ratio between the number of executives that are not members of the board, divided by the total number of executives, is greater than 0.50, and 0 otherwise. Board meetings are likely to be more frequent if directors perform in accordance to shareholders' interests. The related dummy variable takes the value of 1 if the number of board meetings is greater than the mean, computed by sector, and zero otherwise. Finally, CEO non-duality tends to reduce CEOs' opportunistic behaviour (Jensen and Meckling, 1976). The correspondent dummy variable takes the value of 1 if CEOs are not chairpersons at the same time, and 0 otherwise. The composite corporate governance index (*Corp_gov*) is the sum of the three dummy variables described above. Thus, the proxy can take a value between 0 and 3.

We use several control variables that are likely to have an effect both on earnings manipulation proxies and on CEO vulnerability. Current ROA is related to both current earnings management (Kothari et al., 2005) and CEO succession (Shen and Cannella, 2002), and it is computed as the ratio of income before extraordinary items to beginning total assets. To take into account firms' financial structure (DeFond and Jimbalvo, 1994; Minton and Schrand, 1999), we use leverage, computed as the ratio of total liabilities to total assets. Growth opportunities are likely to provide incentives to manipulate earnings (Graham et al., 2005; Skinner and Sloan, 2002) and to increase the importance of individual performance evaluation (Bushman et al., 1996). We measure growth opportunities through the ratio of book value of assets to the market value of equity (book-to-market ratio). Firm size, measured through the natural logarithm of total assets, is

expected to have an influence both on firms' political costs (Watts and Zimmermann, 1990) and on structures and strategies of the firms (Miller, 1991). The standard deviation of operating income before extraordinary items is computed over three-year rolling windows measures firm risk and it is likely to have an impact on CEOs' decision to manipulate earnings, and on CEO vulnerability. Finally, to control for changes in levels of R&D required to stay competitive and that are likely to affect firm strategy, we include R&D intensity (Garcia Osma, 2008) computed as the ratio between R&D expenses and sales.

2.3.6. Research design

To test whether managers engage in earnings management in *t* to mask overinvestment in *t-1*, we apply the following model:

$$Manipulation_{it} = \alpha + \beta_1 Overinvestment_{i,t-1} + \beta_2 Corp\_gov_{it} + \\ + \Sigma\beta_j Controls_{j,it} + u'_{it} + \varepsilon'_{it} \quad (5)$$

Manipulation represents discretionary accruals and sales manipulation, alternatively. *Overinvestment* indicates the three proxies for overinvestment (*Overinvestment_full, Overinvestment_partial*, and *Overfirm*), alternatively. Equation (5) describes a panel data fixed effects model at a firm-level, where the unobservable heterogeneity (u'_i) is considered (Bascle, 2008). In this way, we take into account unobservable characteristics, such as firm culture and management ethics, that are likely to influence both earnings management, and CEOs' decision to overinvest.

To test whether overinvestment is likely to make CEOs less vulnerable in the future, we apply a logit regression that relates the probability of being less vulnerable at time *t*

with overinvestment at time *t-1*. Although hypothesis H2 refers to a decrease in CEO vulnerability in the future as an effect of overinvestment, the narrow time-window of our data constrains us to test the effect of investment inefficiencies from one year to the following one.

$$DTenure_{it} = \alpha + \beta_1 Overinvestment_{i,t-1} + \beta_2 Corp\_gov_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it} \quad (6)$$

Also in this case, *Overinvestment* indicates the three specifications of overinvestment (*Overinvestment_full, Overinvestment_partial*, and *Overfirm*), alternatively. When we apply Equation (6), we expect a positive coefficient for the three proxies of *Overinvestment*. This would suggest that less vulnerable CEOs are more likely to have engaged in overinvestment in the previous period.

2.4. Results

2.4.1. Descriptive statistics

Table 1 shows the descriptive statistics. The variables *DA1*, *DA2* and *SM* have means close to 0 by constructions. The medians of both *Investment_full* and *Investment_partial* are smaller than the corresponding means, meaning that most of the firms have a level of investments lower than the mean. Both mean and median of *Investment_partial* are lower than the mean and the median of *Investment_full*, as acquisitions are not included in *Investment_partial*. *Overfirm* has both mean and median greater than 0.5, which implies that most of the firms are likely to engage in overinvestment. *Corp_gov* is skewed right, meaning that most of the firms hold at least two corporate governance characteristics among those that are taken into account for the computation of the index. In fact, 4,810 firm-year observations, corresponding to the 59.16% of the sample, has a value of

Corp_gov greater than, or equal to, 2. Finally, most of the observations report a value of *DTenure* equal to 1. Only 2,588 observations (31.83% of the sample) have a value of this dummy variable equal to 0, that is, with a CEO tenure lower than 3.

Table 2 reports the pairwise Spearman correlations. Although the correlations between *DA1* and both *Investment_full* and *Investment_partial* are positive and significant, the correlations between *Overinvestment_partial* and both *DA1* and *DA2* are negative and significant. The correlations between *SM* and both *Overinvestment_full* and *Overinvestment_partial* are positive and significant, which is consistent with the hypothesis about the association between overinvestment and sales manipulation. *Overfirm* has a negative correlation with both discretionary accruals and sales manipulation proxies. Finally, CEO vulnerability, measured through the variable *DTenure*, has positive correlations with all the earnings management proxies.

2.4.2. The effects of overinvestment on earnings management

Table 3 reports results about the associations between overinvestment in the previous period and both discretionary accruals and sales manipulation by using *Overinvestment_full* as a proxy of overinvestment. The associations between *Overinvestment_full* and both discretionary accruals and sales manipulation are positive and significant. Untabulated results confirm the positive association between *Overinvestment_full* and the performance-adjusted discretionary accruals proxy (*DA2*) also when *ROA* is added in the model as a control variable. These results are consistent with the prediction of a positive association between overinvestment and subsequent earnings management. The relation between corporate governance characteristics (*Corp_gov*) and discretionary accruals is negative and significant, as in previous literature (Klein, 2002; Xie et al., 2003; Ahmed and Duellman, 2007; Garcia Lara et al., 2009). However, the association between *Corp_Gov* and sales

manipulation (*SM*) is no longer significant. This result suggests that strong corporate governance is able to decrease accounting manipulation, represented by discretionary accruals, but it is not able to reduce sales manipulation, which is more difficult to be detected. The association between ROA and discretionary accruals is positive and significant, consistent with previous literature (Dechow et al., 1995; Kasznik, 1999; McNichols, 2000), whilst the association between ROA and sales manipulation is negative and significant (Cohen and Zarowin, 2010). Results from Table 3 support our first hypothesis stating a positive association between overinvestment and earnings management in the following period. Furthermore, to cover investment inefficiencies, CEOs are likely to manipulate not only accounting numbers, with the consequent effect of decreasing subsequent earnings due to their reversal effect, but also real activities such as sales, with an impact on cash flows and, therefore, on future firm value (Graham et al., 2005; Roychowdhury, 2006).

Table 4 reports results from Equation (5) by using *Overinvestment_partial*, which excludes acquisitions from the definition of investments, as a proxy of overinvestment. By using this alternative proxy of overinvestment, we obtain results confirming the positive associations between overinvestment in the previous period, and current earnings management. The variable *Overinvestment_partial* is positively associated with both *DA* and *SM*, implying that more overinvestment is likely to lead to more discretionary accruals and sales manipulation in subsequent periods. Furthermore, the coefficient of the associations between *Overinvestment_partial* and both *DA1* and *DA2* are roughly as twice as those obtained by using *Overinvestment_full* as a proxy of overinvestment. Results are confirmed if we add *ROA* as a control variable when we use *DA2* as a proxy of discretionary accruals (untabulated result). Table 4 suggests that, at least for discretionary accruals, the definition of investments through items that are difficult to observe, such as

capital expenditures and R&D expenses, leads CEOs to manipulate accounting numbers more intensively than the case in which acquisitions are included. Through discretionary accruals, CEOs are expected to better hide the inefficiency of their investments that are more difficult to be monitored.

Finally, Table 5 shows results on the associations between overinvestment and earnings management by using *Overfirm* as a proxy of overinvestment, which is based on cash balance and leverage. To avoid multicollinearity problems, we do not use leverage as a control variable when we use the variable *Overfirm* in the model. The association between *Overfirm* and *DA1* is positive and significant. When we use ROA for the computation of the discretionary accruals proxy (*DA2*), the association is still positive and significant. Using the performance-adjusted discretionary accruals model allows us to isolate the effects that investment inefficiencies have on earnings management decisions from firm performance as a determinant of discretionary accruals. Thus, firms having *ex-ante* conditions to overinvest, such as high cash balance and low leverage, are also likely to engage in discretionary accruals in the subsequent period. Finally, the association between *Overfirm* and sales manipulation is not significant, arguably because in firms with high cash availability (included in the construction of *Overfirm*), the manipulation of sales may have a reduced negative impact on firms' cash flows (measured through the proxy *SM*), compared to the impact on firms with little cash balance.

2.4.3. The effects of overinvestment on CEO vulnerability

Table 6 shows empirical results for hypothesis H2, which states that vulnerable CEOs are likely to overinvest to decrease their vulnerability in the future. Table 6, Panel A, presents results from Equation (7) in which the variable *Overinvestment_full* is used as a proxy of overinvestment. The log of the odds increases when *Overinvestment_full* increases

and when *Corp_gov* decreases. The signs are confirmed by using the variables for overinvestment and corporate governance both separately and jointly. The positive and significant sign of *Overinvestment_full* suggests that the probability that in the future CEOs become less vulnerable in terms of tenure is higher when they overinvest and when corporate governance is weaker. Also, the negative sign of *Corp_Gov* is consistent with previous literature stating that CEOs dismissal are more likely to occur as the intensity of board monitoring increases (Hermalin, 2005). Untabulated results remains constant when the variable *Overinvestment_partial* is used, instead of *Overinvestment_full*. Results in Panel B, Table 6, are consistent with these statements when the variable *Overfirm* is used. However, because high values of *Overfirm* imply high cash availability and low leverage, the interpretation of Table 6, Panel B, may be spurious, as CEOs' vulnerability may decrease in the future simply because they are running firms well.

2.4.4. Robustness checks

We conduct several robustness checks to validate our results.

Regarding the association between overinvestment and earnings management, we first compute an alternative proxy of overinvestment following Biddle et al. (2009). In Equation (4), we define *Investments* as the sum of capital expenditures, R&D expenditures, and acquisitions, minus sales of PPE, scaled by beginning total assets, and express it as a function of sales growth. Second, we use an alternative configuration of both *Overinvestment_full* and *Overinvestment_partial*. We define them as dummy variables that take the value of 1 if the correspondent value of the residuals falls in the fourth quartile, and 0 otherwise. Third, we include in Equation (5) year dummies to control for aggregate fluctuations. Finally, we proxy discretionary accruals using the forward-looking discretionary accruals model (Dechow et al., 2003), and sales manipulation using CFOs as

in Compustat annual industrial and research files (annual Compustat data item #6) in Equation (3). Results hold after these checks.

With respect to vulnerable CEOs' usage of overinvestment to decrease their vulnerability in the future, results remain stable after including year dummies, and after substituting the *Inv_groups* specifications for a dummy variable that takes the value of 1 if *Inv_efficiency* is in the last quartile, and 0 otherwise.

2.5. Conclusions

Financial reporting is expected to reduce CEOs' opportunistic behaviour (Watts and Zimmerman, 1983; Watts, 2003) as it allows stakeholders to monitor managerial choices. For example, enhanced financial reporting quality is likely to decrease CEOs' overinvestment (Biddle and Hillary, 2006; Verdi, 2006; Biddle et al., 2009; Francis and Martin, 2010). We contribute to this stream of literature in two ways: First, we hypothesize that managers introduce bias to financial reporting information to hide to stakeholders CEOs' investment inefficiencies. We take into account two kinds of financial reporting distortions: Discretionary accruals and sales manipulation. We expect and find a positive association between overinvestment and both discretionary accruals and sales manipulation in the subsequent period. Results also suggest that managers are likely to engage more in discretionary accruals if overinvestment is related to expenditures that are more difficult to monitor (such as capital expenditure and R&D expenses), so that earnings management is more effective in hiding investment inefficiencies. Also, results show that firms that are more likely to overinvest, such as those reporting high cash balance and low leverage, still engage in discretionary accruals. Second, we argue that CEOs overinvest to achieve their personal objectives, such as a decrease in their vulnerability in the future. Results suggest that less vulnerable CEOs are more likely to have overinvested in the previous period,

consistent with the idea that CEOs overinvest to make their replacement more costly (Shleifer and Vishny, 1989), and that overinvestment decreases the probability to be removed through takeovers by making the firm less attractive.

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Table 1: Descriptive statistics

Variables	25th percentile	Mean	Median	75th percentile	Standard deviation
DA1	-0.0406	-0.0047	-0.0018	0.0353	0.1507
DA2	-0.0351	-0.0057	-0.0017	0.0273	0.0608
SM	-0.1096	0.0002	-0.0053	0.0902	0.2225
Investment_full	1.4877	10.8548	6.6019	14.6045	17.3409
Investment_partial	0.2047	6.5590	3.4793	9.6000	14.4287
Overinvestment_full	-1	0.0002	0	1	0.7028
Overinvestment_partial	-1	-0.0033	0	0	0.7069
Overfirm	0.35	0.5506	0.55	0.75	0.2473
Corp_Gov	1	1.6214	2	2	0.8044
DTenure	0	0.6817	1	1	0.4658
TACC	-0.0980	-0.0633	-0.0549	-0.0179	0.1573
Leverage	0.3158	0.4847	0.4804	0.6197	0.3042
ROA	0.0176	0.0479	0.0619	0.1094	0.2068

The number of firm-year observations is equal to 6,424. *DA1* is discretionary accruals, computed through the modified Jones model, as in Dechow et al. (1995); *DA2* is discretionary accruals, computed through the modified Jones model augmented by ROA, as in Kothari et al. (2005); *SM* is sales manipulation computed as the inverted sign of sales manipulation proxy (Roychowdhury, 2006), in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Investment_full* is the sum of capital expenditures, R&D expenditures, and acquisitions, minus sales of PPE and depreciation and amortization, multiplied by 100, and divided by beginning total assets; *Investment_partial* is the sum of capital expenditures and R&D expenditures, minus sales of PPE and depreciation and amortization, multiplied by 100, divided by beginning total assets; *Overinvestment_full* takes the value of (-1) if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall in the first quartile, 0 if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall either in the second or in the third quartile, and 1 if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall in the fourth quartile; *Overinvestment_partial* takes the value of (-1) if the correspondent residuals of investments, measured by the proxy *Investment_partial*, fall in the first quartile, 0 if the correspondent residuals of investments, measured by the proxy *Investment_partial*, fall either in the second or in the third quartile, and 1 if the correspondent residuals of investments, measured by the proxy *Investment_partial*, fall in the fourth quartile; *Overfirm* is a composite measure computed as the average of re-scaled deciles of cash balance and the reciprocal of leverage; *Corp_gov* is a composite measure that is the sum of three dummy variables for internal corporate governance

characteristics (board independence, number of board meetings, CEO non-duality); *DTenure* is a dummy variable that takes the value of 1 if CEO tenure is greater than 3, and 0 otherwise; *TACC* is total accruals, scaled by beginning total assets; *Leverage* is the ratio between total liabilities and total assets; *ROA* is the ratio between income before extraordinary assets and beginning total assets.

Table 2 – Correlation matrix

	DA1	DA2	SM	Investment_full	Investment_partial	Overinvestment_full	Overinvestment_partial	Overfirm	Corp_Gov	DTenure	TACC	Leverage	ROA
DA1	1												
DA2	**0.8394**	1											
SM	**0.0236**	**0.0799**	1										
Investment_full	**0.0438**	-0.0006	**0.1024**	1									
Investment_partial	**0.0437**	-0.0131	**0.1502**	**0.7663**	1								
Overinvestment_full	-0.0148	-0.0090	**0.1701**	**0.5953**	**0.3551**	1							
Overinvestment_partial	**-0.0281**	**-0.0280**	**0.2622**	**0.3978**	**0.5419**	**0.5803**	1						
Overfirm	**-0.0319**	**-0.0996**	0.0010	**0.2259**	**0.3715**	0.0090	**0.1504**	1					
Corp_Gov	**-0.0843**	**-0.0731**	**0.0567**	**0.0413**	**0.0234**	**0.0349**	**0.0337**	**0.0648**	1				
DTenure	**0.0250**	0.0167	-0.0186	**0.0728**	**0.0726**	**0.0185**	**0.0242**	**0.0396**	**-0.2198**	1			
TACC	**0.6839**	**0.6513**	**0.0963**	**-0.0277**	**-0.0441**	**-0.0631**	**-0.0677**	**-0.0496**	**-0.0962**	**0.0239**	1		
Leverage	**-0.0495**	**0.0202**	**0.0542**	**-0.2210**	**-0.3247**	**-0.0278**	**-0.1308**	**-0.8664**	0.0020	**-0.0616**	-0.0103	1	
ROA	**0.1780**	**0.0531**	**-0.1465**	**0.2708**	**0.2559**	**0.0322**	0.0170	**0.2453**	**-0.1094**	**0.0573**	**0.2076**	**-0.2936**	1

Pairwise Spearman correlations. Correlations in bold are significant at the 10% level.

The number of firm-year observations is equal to 6,424. *DA1* is discretionary accruals, computed through the modified Jones model, as in Dechow et al. (1995); *DA2* is discretionary accruals, computed through the modified Jones model augmented by ROA, as in Kothari et al. (2005); *SM* is sales manipulation computed as the inverted sign of sales manipulation proxy (Roychowdhury, 2006), in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary

expenses scaled by beginning total assets of each firm-year observation; *Investment_full* is the sum of capital expenditures, R&D expenditures, and acquisitions, minus sales of PPE and depreciation and amortization, multiplied by 100, and divided by beginning total assets; *Investment_partial* is the sum of capital expenditures and R&D expenditures, minus sales of PPE and depreciation and amortization, multiplied by 100, divided by beginning total assets; *Overinvestment_full* takes the value of (-1) if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall in the first quartile, 0 if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall either in the second or in the third quartile, and 1 if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall in the fourth quartile; *Overinvestment_partial* takes the value of (-1) if the correspondent residuals of investments, measured by the proxy *Investment_partial*, fall in the first quartile, 0 if the correspondent residuals of investments, measured by the proxy *Investment_partial*, fall either in the second or in the third quartile, and 1 if the correspondent residuals of investments, measured by the proxy *Investment_partial*, fall in the fourth quartile; *Overfirm* is a composite measure computed as the average of re-scaled deciles of cash balance and the reciprocal of leverage; *Corp_gov* is a composite measure that is the sum of three dummy variables for internal corporate governance characteristics (board independence, number of board meetings, CEO non-duality); *DTenure* is a dummy variable that takes the value of 1 if CEO tenure is greater than 3, and 0 otherwise; *TACC* is total accruals, scaled by beginning total assets; *Leverage* is the ratio between total liabilities and total assets; *ROA* is the ratio between income before extraordinary assets and beginning total assets.

Table 3 – The association between earnings management tools and investment levels, including acquisitions

VARIABLES	Discretionary accruals		Sales manipulation
	$DA1_t$	$DA2_t$	SM_t
Constant	0.0132	0.0397***	-0.2316***
	(0.39)	(0.00)	(0.00)
$Overinvestment\_full_{t-1}$	0.0023*	0.0030**	0.0107***
	(0.08)	(0.02)	(0.00)
$Corp\_Gov_t$	-0.0025*	-0.0030**	0.0015
	(0.08)	(0.02)	(0.52)
ROA_t	0.3243***		-0.2796***
	(0.00)		(0.00)
$Leverage_t$	0.0015	-0.0227***	0.0383***
	(0.86)	(0.00)	(0.01)
Book to $market_t$	0.0145***	-0.0065**	-0.0004
	(0.00)	(0.04)	(0.95)
Total $assets\ (ln)_t$	-0.0052**	-0.0025	0.0237***
	(0.01)	(0.20)	(0.00)
IB $(stand.\ dev.)_t$	-0.0709***	-0.0883***	-0.0810**
	(0.00)	(0.00)	(0.02)
R&D $intensity_t$	-0.0464	-0.1781***	1.7295***
	(0.37)	(0.00)	(0.00)
Observations	*6424*	*6424*	*6424*
R^2	*0.135*	*0.013*	*0.146*

p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3 reports the results from the following panel data fixed effect model, which controls for both unobservable and observable heterogeneity:

$$Manipulation_{it} = \alpha + \beta_{1i,} Overinvestment\_full_{t-1} + \beta_2 Corp\_gov_{it} + \Sigma\beta_j Controls_{j,it} + u'_{it} + \varepsilon'_{it}$$

DA1 is discretionary accruals, computed through the modified Jones model, as in Dechow et al. (1995); *DA2* is discretionary accruals, computed through the modified Jones model augmented by ROA, as in Kothari et al. (2005); *SM* is sales manipulation computed as the inverted sign of sales manipulation proxy (Roychowdhury, 2006), in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Overinvestment_full* takes the value of (-1) if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall in the first quartile, 0 if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall either in the second or in the third quartile, and 1 if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall in the fourth quartile; *Corp_gov* is a composite measure that is the sum of three dummy variables for internal corporate governance characteristics (board independence, number of board meetings, CEO non-duality); *ROA* is the ratio between income before extraordinary assets and beginning total assets; *Leverage* is the ratio between total liabilities and total assets; *Book to market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *IB (stand dev)* is the standard deviation of income before extraordinary items computed by using rolling firm-specific three-year windows; *R&D intensity* is the ratio between R&D expenses and sales.

Table 4 – The association between earnings management tools and investment levels, excluding acquisitions

VARIABLES	Discretionary accruals		Sales manipulation
	$DA1_t$	$DA2_t$	SM_t
Constant	0.0145	0.0400***	-0.2342***
	(0.34)	(0.00)	(0.00)
$Overinvestment\_partial_{t-1}$	0.0065***	0.0056***	0.0079***
	(0.00)	(0.00)	(0.00)
$Corp\_Gov_t$	-0.0025*	-0.0031**	0.0012
	(0.08)	(0.02)	(0.62)
ROA_t	0.3233***		-0.2825***
	(0.00)		(0.00)
$Leverage_t$	0.0019	-0.0221***	0.0403***
	(0.83)	(0.00)	(0.01)
Book to $market_t$	0.0146***	-0.0064**	-0.0008
	(0.00)	(0.05)	(0.89)
Total assets $(ln)_t$	-0.0054***	-0.0025	0.0241***
	(0.01)	(0.19)	(0.00)
IB (stand. $dev.)_t$	-0.0714***	-0.0886***	-0.0825**
	(0.00)	(0.00)	(0.02)
R&D $intensity_t$	-0.0554	-0.1829***	1.7349***
	(0.28)	(0.00)	(0.00)
Observations	*6424*	*6424*	*6424*
R^2	*0.137*	*0.015*	*0.143*

p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4 reports the results from the following panel data fixed effect model, which controls for both unobservable and observable heterogeneity:

$$Manipulation_{it} = \alpha + \beta_{1i,} Overinvestment\_partial_{t-1} + \beta_2 Corp\_gov_{it} + \Sigma\beta_j Controls_{j,it} + u'_{it} + \varepsilon'_{it}$$

DA1 is discretionary accruals, computed through the modified Jones model, as in Dechow et al. (1995); *DA2* is discretionary accruals, computed through the modified Jones model augmented by ROA, as in Kothari et al. (2005); *SM* is sales manipulation computed as the inverted sign of sales manipulation proxy (Roychowdhury, 2006), in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Overinvestment_partial* takes the value of (-1) if the correspondent residuals of investments, measured by the proxy *Investment_partial*, fall in the first quartile, 0 if the correspondent residuals of investments, measured by the proxy *Investment_partial*, fall either in the second or in the third quartile, and 1 if the correspondent residuals of investments, measured by the proxy *Investment_partial*, fall in the fourth quartile; *Corp_gov* is a composite measure that is the sum of three dummy variables for internal corporate governance characteristics (board independence, number of board meetings, CEO non-duality); *ROA* is the ratio between income before extraordinary assets and beginning total assets; *Leverage* is the ratio between total liabilities and total assets; *Book to market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *IB (stand dev)* is the standard deviation of income before extraordinary items computed by using rolling firm-specific three-year windows; *R&D intensity* is the ratio between R&D expenses and sales.

Table 5 – The association between earnings management tools and the likelihood of overinvesting

VARIABLES	Discretionary accruals		Sales manipulation
	$DA1_t$	$DA2_t$	SM_t
Constant	0.0020	0.0109	-0.2273***
	(0.90)	(0.44)	(0.00)
$Overfirm_{t-1}$	0.0165**	0.0312***	0.0069
	(0.03)	(0.00)	(0.58)
$Corp\_Gov_t$	-0.0026*	-0.0034***	0.0013
	(0.07)	(0.01)	(0.57)
ROA_t	0.3216***		-0.2951***
	(0.00)		(0.00)
Book to $market_t$	0.0143***	-0.0053	-0.0037
	(0.00)	(0.10)	(0.54)
Total assets $(ln)_t$	-0.0049**	-0.0025	0.0254***
	(0.02)	(0.19)	(0.00)
IB (stand. $dev.)_t$	-0.0668***	-0.0870***	-0.0716**
	(0.00)	(0.00)	(0.05)
R&D $intensity_t$	-0.0400	-0.1767***	1.7592***
	(0.44)	(0.00)	(0.00)
Observations	*6424*	*6424*	*6424*
R^2	*0.135*	*0.014*	*0.141*

p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5 reports the results from the following panel data fixed effect model, which controls for both unobservable and observable heterogeneity:

$$Manipulation_{it} = \alpha + \beta_{1i,} Overfirm_{t-1} + \beta_2 Corp\_gov_{it} + \Sigma\beta_j Controls_{j,it} + u'_{it} + \varepsilon'_{it}$$

DA1 is discretionary accruals, computed through the modified Jones model, as in Dechow et al. (1995); *DA2* is discretionary accruals, computed through the modified Jones model augmented by ROA, as in Kothari et al. (2005); *SM* is sales manipulation computed as the inverted sign of sales manipulation proxy (Roychowdhury, 2006), in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Overfirm* is a composite measure computed as the average of re-scaled deciles of cash balance and the reciprocal of leverage; *Corp_gov* is a composite measure that is the sum of three dummy variables for internal corporate governance characteristics (board independence, number of board meetings, CEO non-duality); *ROA* is the ratio between income before extraordinary assets and beginning total assets; *Book to market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *IB (stand dev)* is the standard deviation of income before extraordinary items computed by using rolling firm-specific three-year windows; *R&D intensity* is the ratio between R&D expenses and sales.

Table 6, Panel A – The relation between CEO vulnerability and investment levels, including acquisitions

VARIABLES	(1) DTenure $_t$	(2) DTenure $_t$	(3) DTenure $_t$
Constant	1.4237***	2.4311***	2.4729***
	(0.00)	(0.00)	(0.00)
Overinvestment_full $_{t-1}$	0.1510***		0.1673***
	(0.00)		(0.00)
Corp_Gov $_t$		-0.6404***	-0.6437***
		(0.00)	(0.00)
Leverage $_t$	0.5420	0.1480	0.1319
	(0.11)	(0.67)	(0.70)
ROA $_t$	-0.6199***	-0.6158***	-0.6295***
	(0.00)	(0.00)	(0.00)
Book to market $_t$	-0.1424	-0.1071	-0.1257
	(0.10)	(0.23)	(0.16)
Total assets (ln) $_t$	-0.0322	-0.0311	-0.0319
	(0.17)	(0.19)	(0.18)
IB (stand. dev.) $_t$	-1.2850**	-0.5560	-0.4581
	(0.02)	(0.32)	(0.41)
R&D intensity $_t$	-0.6702	0.5899	0.0664
	(0.26)	(0.32)	(0.91)
Observations	*6424*	*6424*	*6424*
Pseudo R^2	*0.0076*	*0.0457*	*0.0478*

Robust z-values in parentheses
*** z<0.01, ** z<0.05, * z<0.1

Table 6 reports the results from the following logit model:

$$DTenure_{it} = \alpha + \beta_1 Overinvestment\_full^{o}_{i,t-1} + \beta_2 Corp\_gov_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

DTenure is a dummy variable that takes the value of 1 if CEO tenure is greater than 3, and 0 otherwise; *Overinvestment_full* takes the value of (-1) if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall in the first quartile, 0 if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall either in the second or in the third quartile, and 1 if the correspondent residuals of investments, measured by the proxy *Investment_full*, fall in the fourth quartile; *Corp_gov* is a composite measure that is the sum of three dummy variables for internal corporate governance characteristics (board independence, number of board meetings, CEO non-duality); *ROA* is the ratio between income before extraordinary assets and beginning total assets; *Leverage* is the ratio between total liabilities and total assets; *Book to market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *IB (stand dev)* is the standard deviation of income before extraordinary items computed by using rolling firm-specific three-year windows; *R&D intensity* is the ratio between R&D expenses and sales.

Table 6, Panel B – The relation between CEO vulnerability and the likelihood of overinvestment

VARIABLES	(1) DTenure $_t$	(2) DTenure $_t$	(3) DTenure $_t$
Constant	0.9308***	2.2680***	1.8700***
	(0.00)	(0.00)	(0.00)
Overfirm $_{t-1}$	0.3552***		0.4802***
	(0.01)		(0.00)
Corp_Gov $_t$		-0.6399***	-0.6462***
		(0.00)	(0.00)
ROA $_t$	0.7870**	0.5896*	0.3079
	(0.02)	(0.07)	(0.36)
Book to market $_t$	-0.0690	-0.0471	-0.0487
	(0.42)	(0.60)	(0.58)
Total assets (ln) $_t$	-0.0423*	-0.0628***	-0.0349
	(0.07)	(0.00)	(0.14)
CFO (stand. dev.) $_t$	-1.5071***	-0.5285	-0.7425
	(0.01)	(0.34)	(0.18)
R&D intensity $_t$	-0.1524	1.2835**	0.4248
	(0.80)	(0.03)	(0.50)
Observations	*6424*	*6424*	*6424*
Pseudo R^2	*0.0046*	*0.0437*	*0.0452*

Robust z-values in parentheses
*** z<0.01, ** z<0.05, * z<0.1

Table 6 reports the results from the following logit model:

$$DTenure_{it} = \alpha + \beta_1 Overfirm_{i,t-1} + \beta_2 Corp\_gov_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

DTenure is a dummy variable that takes the value of 1 if CEO tenure is greater than 3, and 0 otherwise; *Overfirm* is a composite measure computed as the average of re-scaled deciles of cash balance and the reciprocal of leverage; *Corp_gov* is a composite measure that is the sum of three dummy variables for internal corporate governance characteristics (board independence, number of board meetings, CEO non-duality); *ROA* is the ratio between income before extraordinary assets and beginning total assets; *Book to market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *IB (stand dev)* is the standard deviation of income before extraordinary items computed by using rolling firm-specific three-year windows; *R&D intensity* is the ratio between R&D expenses and sales.

Chapter 3 - Entrenched Managers' Usage of Earnings Management Tools

Abstract

Although managerial entrenchment has been typically considered as a signal of weak governance, we show that entrenched managers engage less in earnings management through discretionary accruals and through real activities manipulation. Both of these earnings management tools are detrimental to firm value. In fact, discretionary accruals decrease subsequent earnings due to its reversal property, and real activities manipulation decreases future firm performance due to its direct impact on cash flow. Furthermore, we show that entrenched managers engage more aggressively in smoothing the earnings stream, which may be considered as less detrimental to firm value. Because entrenched managers are less likely to engage in earnings management tools that reduce future firm performance, we also expect and find a positive association between CEO entrenchment and subsequent firm operating performance.

3.1. Introduction

Managerial entrenchment represents one of the costliest manifestations of the agency problem between shareholders and managers (Jensen and Ruback, 1983). Managers, who place a great value on control but own only a small equity stake, work to ensure their own job security and staying on in that position even if no longer competent or qualified to run the firm (Shleifer and Vishny, 1989). Managerial entrenchment can be thus defined as "the extent to which managers fail to experience discipline from the full range of corporate governance and control mechanisms" (Berger et al., 1997: 1411).

There are different classes of managerial entrenchment practices to neutralize the discipline of corporate governance and control mechanisms. Antitakeover devices, poison pills, or golden parachutes are some examples of such practices (Gompers et al., 2003). Other authors (e.g., De Miguel *et al.*, 2004) have emphasized intermediate levels

of managerial ownership as a takeover deterrence mechanism that promotes managerial entrenchment. The use of these different mechanisms generates a decrease in managerial turnover, which explains why CEO tenure has also been used by different authors as a proxy for managerial entrenchment (Fredrickson et al., 1988; Shen, 2003).

CEOs' entrenchment reduces the probability of a firm to be taken over and, thus, to receive valuable offers that benefit shareholders' wealth (Ambrose and Megginson, 1992; Pound, 1987). Furthermore, CEOs' strategies to entrench themselves, such as anti-takeover devices (Williamson, 1975; Jensen, 1988; Ambrose and Megginson, 1992), or manager-specific investments (Shleifer and Vishny, 1989), lead to the expropriation of shareholders' wealth and to an inefficient allocation of firms' resources.

A competing theoretical perspective states that CEOs' entrenchment can help align managers' interests with those of shareholders. Stein (1989), for example, argues that CEOs that are not entrenched and that, therefore, are under market pressure, tend to behave "myopically" by providing signals of the firm efficiency to the stakeholders through short-term performance increases. As capital markets rarely have access to private information, market-pressured managers are more likely to choose strategies that are able to increase short-term earnings, at the expense of riskier long-term investments that are expected to provide higher benefits in the long run.

We contribute to this stream of literature by arguing that entrenched CEOs are less likely to engage in earnings management tools, such as discretionary accruals and real activities manipulation, to achieve short-term objectives. Contrarily, market-pressured CEOs may engage in both discretionary accruals and real activities manipulation in an effort to mislead markets about firms' short-term value. The manipulation of discretionary accruals leads to an increase of the current share value and to an

accounting reversal effect in subsequent periods, while the manipulation of real activities leads to an increase of the current firm value, first, and to a decrease of future firm's value, later. Both of the effects make firms less attractive as a target of takeovers and incumbent managers are less likely to be removed. Although we expect a negative association between CEOs' entrenchment and both discretionary accruals and real activities manipulation, we also expect a positive association between CEOs' entrenchment and income smoothing, which is more likely to satisfy long-term objectives. Entrenched managers are less pressured by the capital markets and can better focus on long-term objectives. According to a survey conducted by Graham et al. (2005), managers perceive income smoothing as useful to achieve long-term results such as reductions of the cost of capital and debt financing.

The use of earnings management tools as an entrenchment strategy has important implications on firm value. CEOs' entrenchment is expected to be negatively associated to both discretionary accruals and real activities manipulation, which are detrimental to firm value. Discretionary accruals have the effect of decreasing subsequent earnings due to their reversal effect. Real activities manipulation directly affects cash flow and, thus, the future value of firms (Roychowdhury, 2006). However, entrenched CEOs are expected to smooth the earnings stream, which can be less detrimental to firm future performance. Although part of the literature states that income smoothing is not beneficial for shareholders, as it decreases earnings informativeness (Bhattacharya et al., 2003), better masks CEOs' private interests (Leuz et al., 2003), and has no association with firm value (Rountree et al., 2008; McInnis, 2010), some authors argue that income smoothing increases earnings informativeness if managers use this manipulation tool to communicate their assessment of future earnings (Tucker and Zarowin, 2006), and that income smoothing is valuable to stockholders, as it decreases firms' cost of borrowing

(Trueman and Titman, 1988). We then expect a positive association between CEOs' entrenchment and subsequent firm operating performance as a consequence of the effects that entrenched CEOs' usage of earnings management tools have on future operating performance in the following periods.

We test these contentions using a US sample for the period 1992-2006. We take accounting data from Compustat, corporate governance characteristics from Execucomp, and stock returns from CRSP. The final sample consists of 11,802 firm-year observations and of 1,714 different firms. We create our own measure of entrenchment through a composite index that takes into account the antitakeover provision index proposed by Bebchuck et al. (2009), CEO tenure, and managerial ownership. Results support the expectations: CEOs' entrenchment is positively associated with income smoothing, and negatively associated with both discretionary accruals and real activities manipulation. We also study the association between future operating performance (measured through ROA in subsequent periods), and the use of the different earnings management tools. Our results show that income smoothing is less detrimental to firm operating performance in the following years than discretionary accruals and, especially, real activities manipulation. Real activities manipulation is the earnings management tool that decreases future firm operating performance the most. Consistent with entrenched managers using more income smoothing, less discretionary accruals, and less real activities manipulation to manage earnings, our performance tests show that entrenchment is positively related to future operating performance over the two coming years. These results are robust to alternative measures of earnings management tools and to the use of several estimation methods.

The remainder of the paper is organized as follows: Section 2 defines the earnings management tools and highlights the opportunities that these tools offer to CEOs to

entrench themselves, and their consequences on future firm performance. Section 3 develops the hypotheses. Section 4 describes data, variable definitions and empirical methods. Section 5 reports the results. Section 6 concludes.

3.2. Earnings management tools

In our analysis of the effect of managerial entrenchment practices on CEO's preferences for the use of different earnings management tools, we focused on three types of earnings management tools: income smoothing, discretionary accruals, and real activities manipulation. CEOs use different earnings management tool according to its effect on firm value both on the short- and on the long-run.

3.2.1. Income smoothing

Income smoothing is defined as the "process of manipulating the time profile of earnings or earnings reports to make the reported income stream less variable" (Fudenberg and Tirole, 1995: 75). CEOs make income streams less variable by shifting earnings from good years to less successful years.

Previous literature has discussed the effects of income smoothing on firm future performance. Some authors observe that income smoothing does not have favorable consequences for shareholders. If income streams are artificially smooth, they decrease the informativeness of reported earnings and, thus, increase earnings "opacity" (Bhattacharya et al., 2003). In this way, managers can better mask their private control benefits (Leuz et al., 2003). Besides the negative effect on the informativeness of earnings, recent literature argues that income smoothing does not lower the implied cost of equity and does not lead to greater average returns. McInnis (2010), for example, finds no relationship between earnings smoothness and average stock returns. Rountree

et al. (2008) show that, while the volatility of cash flows is actually negatively related to firm value, the volatility of earnings, which can be manipulated by managers through accruals to obtain smoother income streams, has no association with firm value. Other authors, however, argue that income smoothing has positive effects for shareholders. In a survey conducted by Graham et al. (2005), more than 96% of chief financial officers (CFOs) argue that they engage in income smoothing to lower investors' perceptions of firm risk. CFOs expect smoother income decreases both cost of capital and cost of debt. Income smoothing is also likely to reduce idiosyncratic risk (Gill-de-Albornoz and Markarian, 2009), and to increase future earnings informativeness (Tucker and Zarowin, 2006) if CEOs use this tool to provide further information about their future earnings expectations.

3.2.2. Discretionary accruals

Discretionary accruals are based on the manipulation of accrual accounting, which can be defined as "the accrual and deferral of past, current and anticipated future cash receipts and disbursements" (Richardson et al., 2005: 441). Because the computation of accruals is based on assumptions and estimates, CEOs can opportunistically manipulate it to mislead users of financial statements (Jones, 1991; Dechow and Dichev, 2002).

CEOs engage in discretionary accruals to increase firm value on the short run, as the effects of discretionary accruals must reverse some time in the future. Previous literature observes that CEOs engage in discretionary accruals to achieve specific short-term objectives, highlighting the reversal effect that this earnings management tool has on subsequent firm performance. Teoh et al. (1998), for example, find that managers temporarily increase reported incomes through discretionary accruals before an initial public offering (IPO) to lead buyers to pay higher prices. However, after the IPO, firms

engaging in discretionary accruals before the IPO are likely to experience lower cumulative abnormal returns than firms not engaging in discretionary accruals.

3.2.3. Real activities manipulation

Real activities manipulation is defined as "departures from normal operational practices, motivated by managers desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations" (Roychowdhury, 2006: 337). For example, CEOs can temporarily increase sales by offering price discounts or more lenient credit terms.

CEOs are likely to engage in real activities manipulation to increase reported earnings on the short-run, as real activities manipulation has the effect of decreasing long-term firm performance. For example, Cohen and Zarowin (2010) show that, during seasoned equity offerings (SEOs), firms are likely to engage in both discretionary accruals and real activities manipulation. However, the authors observe that the decline in firms' performance is more severe after real activities manipulation rather than after discretionary accruals, as real activities manipulation directly affects cash flows.

3.3. Hypotheses development

In this section, we develop hypotheses about the effects that CEOs' entrenchment has on income smoothing, discretionary accruals, and real activities manipulation. Later, we analyze how CEOs' entrenchment can affect subsequent operating performance.

3.3.1. CEOs' entrenchment and performance manipulation

Although CEOs' entrenchment is typically conceived as a manifestation of the agency problem, an alternative stream of literature observes that managerial

entrenchment can increase the alignment between managers' and shareholders' interests. Under certain circumstances, entrenchment can be optimal to reduce managers' "myopia". As capital markets rarely have access to private information of the firm, market-pressured managers tend to focus on quantifiable results (such as accounting numbers). Therefore, CEOs that are under capital market pressures are likely to prefer short-term objectives to show immediate results, rather than long-term objectives that may imply a risk on the short run. In this context, executives are likely to focus on strategies that can be considered as risk-averse (Sundaramurthy et al., 1997), which may not be optimal for shareholders' wealth (Baysinger et al., 1991). On the contrary, entrenched CEOs are less likely to be removed, so that they can better focus on long-term decisions (Johnson and Rao, 1997). Income smoothing represents the earnings management tool that better fits entrenched CEOs' expectations, because CEOs perceive it as able to satisfy long-term objectives. According to a survey conducted by Graham et al. (2005), CFOs smooth income to ease analysts' task of predicting future earnings. Furthermore, in this survey managers argue that, in presence of smoother earnings, investors demand less risk premium, resulting in lower cost of equity and debt. We then expect that the more entrenched the CEOs, the more they are likely to engage in income smoothing.

H1: CEOs' entrenchment is positively associated with income smoothing.

If CEOs are not entrenched, they are expected to provide signals about their ability to keep their position. To reach this objective, they may increase such a signal even at the expense of future firms' profit. In this case, CEOs are likely to distort information by manipulating either discretionary accruals, or real operations at the expense of long-term

profits (Hermalin and Weisbach, 2009). Typically, takeovers are more likely to occur when the difference between the future value of the firm and the current share value is high. To reduce the probability of takeovers, CEOs can either reduce firm's future value, or increase the current share value. CEOs reduce future firm's value because "the fear of takeover cause[s] managers to behave myopically and therefore to sacrifice long-term benefits to increase short-term profits" (Jensen, 1988: 25). Real activities manipulation has the effects of increasing current earnings, decreasing long-term firm value and, thus, making the firm less attractive. Alternatively, CEOs can increase current share value through discretionary accruals, which temporarily improve firm's performance without decreasing long-term firm value.

H2: CEOs' entrenchment is negatively associated with discretionary accruals.

H3: CEOs' entrenchment is negatively associated with real activities manipulation.

3.3.2. Entrenched CEOs' usage of earnings management tools and subsequent firm operating performance

Entrenched CEOs' usage of earnings management tools is likely to affect subsequent operating performance. Entrenched CEOs are less likely than non-entrenched CEOs to engage in earnings management tools that are detrimental to future operating performance, such as discretionary accruals and, especially, real activities manipulation. Discretionary accruals used to increase current earnings will subsequently reduce earnings in the coming years. Real activities manipulation directly affects cash flows and, thus, future firm value. For example, aggressive price discounts or more lenient

credit terms increase the probability of lower future cash flows (Roychowdhury, 2006). However, entrenched CEOs are likely to engage more aggressively in income smoothing, which can be less detrimental to firm value. Although part of the literature argues that income smoothing increases earnings opacity (Bhattacharya et al., 2003), further amplifies the conflict of interests between managers and shareholders (Leuz et al., 2003), and cannot be associated neither to average stock returns (McInnis, 2010), nor to future firm value (Rountree et al., 2008), other authors argue that income smoothing is beneficial to shareholders because it has positive long-term effects, such as a decrease of the cost of borrowing (Trueman and Titman, 1988), and because it allows managers to provide information about their expectations of future earnings (Tucker and Zarowin, 2006). Because entrenched CEOs are those that are less likely to engage in earnings management tools that can harm future firm operating performance, we expect that entrenchment is positively associated to subsequent operating performance.

H4: CEOs' entrenchment is positively associated with subsequent operating performance.

3.4. Data, variable definitions, and methods

3.4.1. Data

To test our hypotheses we use a sample of US firms for the period 1992-2006. We collect accounting data from the Compustat annual industrial and research files. Data about internal control and compensation mechanisms are taken from the Compustat Executive Compensation (ExecuComp) dataset. We collect the data about stock returns from CRSP. We exclude firms in regulated industries (SIC codes between 4400 and 5000), and financial institutions (SIC codes between 6000 and 6500). We also exclude

each firm-year observation that has not the data necessary to calculate all the earnings management proxies. The final sample consists of 11,802 firm-year observations, corresponding to 1,714 different firms.

3.4.2. Measurement of earnings management tools

We separately estimate three different earnings management tools: Income smoothing, discretionary accruals, and real activities manipulation.

We measure income smoothing as the standard deviation of net income (annual Compustat data item #18), scaled by beginning total assets (annual Compustat data item #6), divided by the standard deviation of cash flows from operations (annual Compustat data item #308), scaled by beginning total assets (annual Compustat data item #6) (Francis et al., 2004). To compute income smoothing, we use rolling firm-specific three-year windows. According to this measure, the smaller the value of the measure, the smoother the income stream. To ease the interpretation, we use the reciprocal of this measure, that we denote as *IS*.

Discretionary accruals (*DA*) are the firm-specific discretionary portion of total accruals. We estimate discretionary accruals by using the forward-looking discretionary accruals model of Dechow et al. (2003). This model is a modified version of the popular Jones (1991) model, and takes into account the non-discretionary portion of changes in accounts receivable, previous amounts of total accruals, and future sales growth. Discretionary accruals are the residuals from the estimation of the following expression:

$$\frac{TACC_{it}}{A_{i,t-1}} = \alpha_1 + \beta_1 \frac{\left[(1+k)\Delta Sales_{it}\right] - \Delta REC_{it}}{A_{i,t-1}} + \beta_2 \frac{PPE_{it}}{A_{i,t-1}} + \beta_3 \frac{TACC_{i,t-1}}{A_{i,t-1}} + \\ + \beta_4 \frac{GR\_Sales_{it}}{A_{i,t-1}} + \varepsilon_{it} \quad (1)$$

where *i* indicates the firm, *t* the year, *TACC* represents total accruals, computed as the difference between net income before extraordinary items and cash flows from operations (annual Compustat data item #18 – annual Compustat data item #308), *A* is total assets (annual Compustat data item #6), *ΔSales* is the change in net sales (annual Compustat data item #12), *ΔREC* is change in accounts receivables (annual Compustat data item #302), *PPE* is gross property, plant and equipment (annual Compustat data item #7) and *GR_Sales* is the change in sales from current year to the following year. *k* captures the expected change in accounts receivable for a given change in sales. This coefficient is computed by running the following regression for each 2-digit SIC code and year:

$$\Delta REC = \alpha_1 + k\Delta Sales_{it} + \varepsilon_{it} \qquad (2)$$

The mean (median) of the coefficient is equal to 0.1630 (0.1256). [2]

To analyze the association between real activities manipulation and CEOs' entrenchment, we focus on one specific type of distortion from the normal operational practices: The manipulation of sales. Following Roychowdhury (2006), to estimate the manipulation of sales we use the following model:

$$\frac{CFO_{it}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \beta_1\left(\frac{S_{it}}{A_{i,t-1}}\right) + \beta_2\left(\frac{S_{it} - S_{i,t-1}}{A_{i,t-1}}\right) + \varepsilon_{it} \qquad (3)$$

[2] As in Dechow et al. (2003), the negative values of *k* are re-coded as zero.

where *CFO* is cash flow from operations (annual Compustat data item #308), *A* is total assets (annual Compustat data item #6), and *S* is sales (annual Compustat data item #12). This model is estimated for each year *t* and for every industry classified by its 2-digit SIC code. To disentangle the effects that other kinds of real activities manipulation can have on operating cash flows, we add to *CFO* the difference between the medians by year and by sector of the discretionary expenses scaled by beginning total assets and the actual firms' discretionary expenses scaled by beginning total assets. In this way, CFOs are more likely to be free from the increasing effects that the manipulation of discretionary expenses has on cash flows. We then obtain our proxy for real activities manipulation by re-running Equation (2) using this alternative definition of CFOs. Our final proxy for sales manipulation is the residual of the model. The smaller the value of the residual, the higher the distortion of operational practices, as firms artificially increasing sales volume present a level of cash flow unusually lower than the rest of the firms. We multiply the residual by minus one, denote it *RAM*, and use it as our main proxy for real activities manipulation.

To measure the effects that both earnings management tools and CEOs' entrenchment have on subsequent operating performance, we use subsequent return on assets (ROA) defined as earnings before extraordinary items, divided by beginning total assets.

3.4.3. Measurement of entrenchment and internal governance

We measure entrenchment and internal corporate governance characteristics by using a composite measure for each of the two attributes. The use of indices instead of individual provisions of both entrenchment and internal corporate governance

characteristics is expected to decrease the noise that these individual proxies are likely to have.

We measure CEOs' entrenchment with a composite index composed of three proxies for entrenchment: CEO tenure, the entrenchment index proposed by Bebchuk et al. (2008), and managerial ownership.

1) *CEO tenure*: CEOs' entrenchment increases over time (Shen, 2003). At the beginning of their tenure, CEOs need to develop their leadership skills to meet the demand of their new job. Later, the probability of managerial opportunism increases. Fredrickson et al. (1988) argue that early vulnerability occurs when CEO tenure is less than, or equal to, three years. After three years, CEOs start gaining power and becoming more entrenched. We then construct a dummy variable taking value 1 if CEO tenure is greater than 3, and 0 otherwise.
2) *Entrenchment index*: Starting from the popular G-index elaborated by Gompers et al. (2003), Bebchuck et al. (2008) investigate the importance of the twenty-four provisions included in this index and conclude that most of the provisions represent noise. They state that six provisions (staggered boards, limits to shareholders amendments of bylaws, supermajority requirements for mergers, supermajority requirements for charter amendments, poison pills, and golden parachutes) of the original twenty-four are mainly responsible for the associations between the G-index and firm value. They then propose a new index, which they call *Entrenchment index*, or *E-index*, that includes only these six provisions and that ranges between 0 to 6. The higher the value, the more entrenched the managers. We use this index as a proxy of CEOs' entrenchment by computing a dummy variable that takes the value of 1 if the E-index is greater than 3, and 0 otherwise.

3) *Equity stocks*: Previous literature (De Miguel et al., 2004) argues that CEOs are more entrenched at an intermediate level of managerial ownership. When CEOs' ownership is below a lower bound, capital market can easily force CEOs to satisfy shareholders' interests. If CEOs' ownership is higher than an upper bound, managers' interests are likely to be aligned to those of shareholders. By using, as a proxy of managerial ownership, the number of shares owned by CEOs through firms' compensation mechanisms, divided by the number of firms' common shares outstanding, we replicate the model of De Miguel et al. (2004), which relates firm value to managerial ownership. Size, leverage and investments are used as control variables. We obtain that firm value decreases in the range between 20.28% and 66.83% of CEOs' ownership. Managerial ownership values within this range correspond to the entrenchment area. Thus, we construct a dummy variable that takes the value of 1 if the proportion of CEOs' shares over total shares of the firm falls into this range, and 0 otherwise.

The index (*Entrenchment*) is computed by adding one point for each dummy variable taking the value of 1. Thus, the proxy *Entrenchment* goes from 0 (all the three dummy variables are equal to 0) to 3 (all the dummy variables are equal to 1).

To construct the composite measure of internal corporate governance, we use three corporate governance characteristics: Board independence, number of board meetings, and CEO non-duality.

1) *Board independence*: Our proxy for board independence is related to the presence of independent directors on the board. Previous literature shows that the composition of the board positively influence board decisions. Weisbach (1988) observes that the presence of independent directors is positively associated to boards' decisions of CEOs' removal. Byrd and Hickman (1992) find that in

successful tender offers, bidding firms with a majority of outside directors perform better than those with a majority of inside directors. In our model, we use a dummy variable that takes the value of 1 if the ratio of the number of executives that are not members of the board, divided by the total number of executives, is greater than 0.50, and 0 otherwise.

2) *Number of board meetings*: It is argued (Lipton and Lorsch, 1992), that directors which meet often are more likely to perform in accordance to shareholders' interests. In our model, we use a dummy variable that takes the value of 1 if the number of board meetings is equal to, or greater than, the mean, computed by sector, and 0 otherwise.

3) *Non-duality*: According to the agency theory, CEO duality tends to favor CEO entrenchment and, as a consequence, the CEOs' opportunistic behavior that reduces shareholders wealth (Jensen and Meckling, 1976). Thus, CEO duality can be interpreted as a signal of separation between ownership and control (Fama and Jensen, 1983). As a proxy for CEO non-duality, we construct a dummy variable that takes the value of 1 if the CEO and chairperson positions are not held by one individual, and 0 otherwise.

We then compute a composite corporate governance index (*Corp_Gov*) by adding one point for each observation in which the dummy variables used as proxies for corporate governance take the value of 1. Thus, the measure *Corp_Gov* can take a value between 0 and 3.

We use several control variables that are likely to determine firms' earnings management. To control for the other anti-takeover provisions that are part of the G-index but that are not included in the E-index, we include in the model these other provisions (O-index), computed as the difference between the G-index and the E-index

for each firm-year observation. To take into account firms' financial structure (DeFond and Jimbalvo, 1994; Minton and Schrand, 1999), we use leverage, computed as the ratio of total liabilities to total assets. We use current ROA, measured as the ratio of income before extraordinary items to beginning total assets, to control for current firms' performance that can partly determine current earnings management (Kothari et al., 2005), and future operating performance (Bens et al., 2002). We measure growth opportunities through the book-to-market ratio, computed as the book value of assets to the market value of equity, to take into account the incentives growth opportunities may provide to manipulate earnings (Graham et al., 2005; Skinner and Sloan, 2002) and their effects on future ROA. We measure firm size through the logarithm of total assets, as larger firms face more political costs (Watts and Zimmermann, 1990) and are likely to manipulate earnings to reduce undesired visibility. Firm size is also likely to positively influence future ROA (Berger and Ofek, 1995). Riskier firms are expected to manipulate earnings more to cover their real risk and to negatively influence firms' future operating performance. As a proxy for risk we use the standard deviation of CFO over three-year rolling windows. Current stock prices are likely to positively influence future earnings (Kothari and Sloan, 1992) and to condition earnings management choice. To control for trends in stock prices, we include the one-year holding period return on investment in firms' common stock.

3.4.4. Research design

To test the hypotheses about the direct associations between CEOs entrenchment and earnings management tools (H1, H2 and H3), we use the following OLS estimation model:

$$Manipulation_{it} = \alpha + \beta_1 Entrenchment_{i,t-1} + \beta_2 Corp\_Gov_{i,t-1} + \\ + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it} \quad (4)$$

The variable *Manipulation* is separately estimated for income smoothing, discretionary accruals, and real activities manipulation. *Entrenchment* is the composite measure of CEOs entrenchment. *Corp_Gov* is the internal corporate governance index. *Controls* designates the control variables.

To study the effects that each manipulation tool has on future operating performance, we use the following model:

$$ROA_{i,t+j} = \alpha + \beta_1 Manipulation_{it} + \beta_2 ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it} \quad (5)$$

$ROA_{i,t+j}$ represents the future operating performance of firm *i* at time *j*, where *j* can take the value of 1 or 2. Current ROA controls for time series properties and current performance. Following Gunny (2005), we also check the effects of the persistence of current ROA for earnings management tools on future ROA through the following model:

$$ROA_{i,t+j} = \alpha + \beta_1 Manipulation_{it} + \beta_2 ROA_{it} + \beta_3 Manipulation_{it} \times ROA_{it} + \\ + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it} \quad (6)$$

The interaction term in Equation (6) controls for the effects that earnings management tools have on future ROA, by taking into account the persistent effect that current ROA is likely to have on the result.

Finally, to test the association between entrenchment and subsequent operating performance (H4), we use Equations (5) and (6) by replacing the earnings management proxies with the variable *Entrenchment*. Thus, the models take the following specifications:

$$ROA_{i,t+j} = \alpha + \beta_1 Entrenchment_{it} + \beta_2 ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it} \quad (7)$$

$$ROA_{i,t+j} = \alpha + \beta_1 Entrenchment_{it} + \beta_2 ROA_{it} + \beta_3 Entrenchment_{it} \times ROA_{it} + \\ + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it} \quad (8)$$

3.5. Results

3.5.1. Descriptive statistics

Table 1 shows the descriptive statistics. Income smoothing has a mean equal to 2.1345, meaning that the variability in operating cash flows is greater than the variability in net income The proxy of income smoothing is the reciprocal of the ratio between the variability of the standard deviation of net income before extraordinary items divided by beginning total assets, and the standard deviation of cash flow from operations divided by beginning total assets. The mean of this ratio (which is not reported in Table 1) is equal to 1.3536, which is similar to the mean of previous papers (Zarowin, 2002). The variable *Entrenchment* is skewed right, meaning that most of the observations are concentrated on the left. Actually, only the 16.76% of the sample has a value of *Entrenchment* equal to, or greater than, 2. The variable *Corp_gov* is skewed left, meaning that most of the firms have few strong corporate governance characteristics. In fact, the 42.60% of firms in the sample has a value of *Corp_gov* greater than, or equal to, 2. Table 2 reports the correlation matrix. In general, there is no high correlation between the independent variables used in our models. *Entrenchment*

has significant and positive correlation with income smoothing, a negative and significant correlation with real activities manipulation, and a non-significant correlation with discretionary accruals. Also, *Entrenchment* is negatively correlated to *Corp_gov*, meaning that stronger internal corporate governance is likely to lead to less entrenched CEOs, and positively correlated to current ROA. The composite index for internal control has negative and significant correlation with both income smoothing and discretionary accruals, and a positive and significant correlation with real activities manipulation. Current ROA has a positive and significant correlation with income smoothing and discretionary accruals, and a negative and significant correlation with real activities manipulation.

3.5.2. The relation between entrenchment and earnings management tools

The three Panels in Table 3 report results from estimating Equation (4) for each earnings management tool. The number of observations decreases with respect to the available firm-year observations because of the match with the antitakeover provisions data and varies depending on the earnings management tool used as dependent variable, as each proxy has different missing values.

Entrenchment is positively related to income smoothing, confirming that entrenched CEOs tend to smooth income to achieve long-term objectives. On the contrary, internal corporate governance has a negative and significant association with income smoothing, showing that internal control mechanisms limit the use of income smoothing. Discretionary accruals have a negative association with both entrenchment and internal corporate governance characteristics. Results support the hypothesis that entrenched CEOs engage less in discretionary accruals than market-pressured CEOs, who are more likely to use this earnings management tool to provide short-term signals to the capital

markets. Also, the negative association between internal corporate governance characteristics and discretionary accruals confirms that stronger internal control reduces short-tem accounting manipulation (Klein, 2002; Xie et al., 2003; Ahmed and Duellman, 2007; Garcia Lara et al., 2009). The association between real activities manipulation and entrenchment is negative and significant, which means that entrenched CEOs engage less in sales manipulation. Internal corporate governance characteristics are positively related to real activities manipulation. As this manipulation tool is more difficult to be detected, stronger internal controls decrease accounting manipulation, but they are likely to have the undesired effect of leading CEOs to manipulate operational practices. Both univariate and multivariate analyses support the findings above.

3.5.3. The effects of earnings management tools on future performance

Panels A, B and C of Table 4 report results from Equations (5) and (6), used to study the effects of each earnings management tool on subsequent operating performance. We do study the performance effects directly (Equation 5) and through the effects over the persistence of ROA (Equation 6). Table 4, Panel A, shows results using income smoothing (*IS*) as the earnings management tool. In the model without the interaction term, income smoothing is positively related to ROA both at year *t+1* and at year *t+2*. When the interaction term is included, the coefficient of income smoothing becomes negative and significant, and current ROA positively moderates the association between income smoothing and future ROAs. We can conclude that, in general, income smoothing has not a negative effect on future operating performance.

Table 4, Panel B, shows results using discretionary accruals (*DA*). Results from Equation (5) show that discretionary accruals have a negative impact on future operating

performance. When Equation (6) is applied, the coefficient of discretionary accruals remains negative and significant, but the persistence effect that current ROA has on ROA both at time *t+1* and at time *t+2* is no longer significant.

Finally, Table 4, Panel C considers the case of sales manipulation (*RAM*). Without the interaction term, the coefficient of sales manipulation is negative and significant both at time *t+1* and at time *t+2*. Unlike discretionary accruals, the persistence of ROA for real activities manipulation, represented by the interaction term, is negative and significant. If the moderator effects of current levels of ROA are taken into account, sales manipulation negatively influences future firm operating performance more than discretionary accruals.

3.5.4. The effects of CEO's entrenchment on future performance

Table 5 reports results of Equations (7) and (8), in which the association between entrenchment and subsequent operating performance is considered. Without the interaction effect, CEOs' entrenchment is positively associated with ROA both at time *t+1* and at time *t+2.* If the persistence effect of current ROA is included, the coefficients of the variable *Entrenchment* become negative and significant. However, current ROA positively moderates the association between CEOs' entrenchment and operating performance in the two following periods. Results from Equation (8) show that the association between entrenchment and subsequent ROAs is positive when the moderator effect of current ROA is not considered, and positive and with a greater coefficient if the persistence of ROA is taken into account in the determination of the results. This is consistent with our hypothesis stating that entrenchment is positively associated with subsequent operating performance (H4), because entrenched CEOs are less likely to engage in earnings management tools that are more detrimental to firm performance.

3.5.5. Sensitivity checks

We alternatively measure income smoothing as the correlation between changes in accruals and changes in operating cash flows (Leuz et al., 2003). To calculate this, we use rolling firm-specific three-year windows. The expected sign of this correlation is negative (Dechow, 1994), and larger magnitudes of the negative correlation indicate smoothing of reported earnings that does not reflect the actual economic performance (Leuz et al., 2003). To ease the interpretation of our second proxy of income smoothing, we multiply the correlation by (-1), so that the greater the value, the smoother the income. As an alternative proxy of discretionary accruals, we use the Jones (1991) model. Using this proxy as the dependent variable in Equation (4), our main inferences do not change.

We construct different specifications of the composite variables of entrenchment and internal corporate governance characteristics by constructing dummies based on means and medians, computed by sector, of the single entrenchment and governance provisions. Results are qualitatively similar.

Further sensitivity checks include the use year and sector dummies in the estimation models (first separately, and then jointly) and adjustments of the models by using clustered standard errors for year or sector. Results are similar to those described above.

3.6. Conclusions and further research

Although part of the literature argues that managerial entrenchment amplifies the conflict of interests between CEOs and shareholders, an alternative stream of research suggests that managerial entrenchment help reduce managers' "myopia". We contribute to this stream of literature by showing that entrenched CEOs are less likely to engage in

discretionary accruals and in real activities manipulation. We also show that entrenched CEOs engage more aggressively in income smoothing. While academics do not uniquely agree about the effects that income smoothing has on future firm performance, discretionary accruals and, especially, real activities manipulation are detrimental to future firm performance. As a consequence, we show that CEOs' entrenchment is generally positively related to future performance.

Further research could focus on how market participants (i.e. investors and analysts) consider CEO entrenchment. If investors and analysts are aware that entrenchment can reduce managerial myopia, they may hold a less negative view of managerial entrenchment.

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Table 1: Descriptive statistics

Variables	25th percentile	Mean	Median	75th percentile	Standard deviation
CFO	0.0612	0.1167	0.1132	0.1706	0.1215
TACC	-0.0969	-0.0645	-0.0552	-0.0199	0.1750
Leverage	0.3558	0.5062	0.5149	0.6429	0.2238
ROA	0.0194	0.0522	0.0615	0.1079	0.2012
IS	0.7071	2.1345	1.3073	2.5138	2.5214
DA	-0.0239	-0.0007	0	0.0304	0.1109
RAM	-0.1083	-0.0081	-0.0085	0.0772	0.1753
Entrenchment	0	0.9112	1	1	0.6514
Corp_gov	1	1.3533	1	2	0.8684

The number of firm-year observations is equal to 9,739. *CFO* is operating cash flow, scaled by beginning total assets; *TACC* is total accruals, scaled by beginning total assets; *Leverage* is the ratio between total liabilities and total assets; *ROA* is the ratio between income before extraordinary assets and beginning total assets; *IS* is income smoothing, computed as the reciprocal of the ratio of firm *i*'s standard deviation of net income before extraordinary items divided by beginning total assets, to its standard deviation of cash flow from operations divided by beginning total assets, calculated over rolling three-year windows; *DA* is discretionary accruals, computed through the forward-looking discretionary accruals model, as in Dechow et al. (2003); *RAM* is real activities manipulation, computed as the inverted sign of sales manipulation proxy (Roychowdhury, 2006), in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Entrenchment* is a composite measure and is the sum of three dummy variables, where each refers to an entrenchment proxy (CEO tenure, Entrenchment index, and managerial entrenchment); *Corp_gov* is a composite measure that is the sum of three dummy variables for internal corporate governance characteristics (board independence, number of board meetings, CEO non-duality).

Table 2 – Correlation matrix

	CFO	TACC	Leverage	ROA	IS	DA	RAM	Entrenchment	Corp_gov
CFO	1								
TACC	**-0.1147**	1							
Leverage	**-0.1501**	-0.0027	1						
ROA	**0.5039**	**0.8002**	**-0.0929**	1					
IS	**0.0529**	**0.0761**	0.0076	**0.0977**	1				
DA	-0.0076	**0.8680**	-0.0095	**0.6607**	**0.0464**	1			
RAM	**-0.2665**	**0.0489**	**0.0441**	**-0.1780**	**-0.0612**	**0.0566**	1		
Entrenchment	0.0162	**0.0355**	0.0019	**0.0407**	**0.0514**	-0.0045	**-0.0263**	1	
Corp_gov	**-0.0488**	**-0.0596**	**0.0181**	**-0.0812**	**-0.0870**	**-0.0380**	**0.0785**	**-0.2094**	1

Pairwise Spearman correlations. Correlations in bold are significant at the 10% level.

The number of firm-year observations is equal to 9,739. *CFO* is operating cash flow, scaled by beginning total assets; *TACC* is total accruals, scaled by beginning total assets; *Leverage* is the ratio between total liabilities and total assets; *ROA* is the ratio between income before extraordinary assets and beginning total assets; *IS* is income smoothing, computed as the reciprocal of the ratio of firm *i*'s standard deviation of net income before extraordinary items divided by beginning total assets, to its standard deviation of cash flow from operations divided by beginning total assets, calculated over rolling three-year windows; *DA* is discretionary accruals, computed through the forward-looking discretionary accruals model, as in Dechow et al. (2003); *RAM* is real activities manipulation, computed as the inverted sign of sales manipulation proxy (Roychowdhury, 2006), in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Entrenchment* is a composite measure and is the sum of three dummy variables, where each refers to an entrenchment proxy (CEO tenure, Entrenchment index, and equity stocks); *Corp_gov* is a composite measure that is the sum of three dummy variables for internal corporate governance characteristics (board independence, number of board meetings, CEO non-duality).

Table 3: The associations between earnings management tools and CEOs' entrenchment

	Accounting manipulation						Real activities manipulation		
	Panel A: Income smoothing			*Panel B: Discretionary accruals*			*Panel C: Sales manipulation*		
	IS	IS	IS	DA	DA	DA	RAM	RAM	RAM
Intercept	-0.5793***	-0.1171	-0.2216	0.0077	0.0093	0.0127**	0.0336***	0.0069	0.0142
	(0.00)	(0.53)	(0.26)	(0.19)	(0.13)	(0.04)	(0.01)	(0.59)	(0.29)
Entrenchment $_{t-1}$	0.1342***		0.0872*	-0.0021*		-0.0028**	-0.0082***		-0.0056*
	(0.00)		(0.05)	(0.06)		(0.01)	(0.01)		(0.07)
Corp_Gov $_{t-1}$		-0.2105***	-0.1964***		-0.0023**	-0.0028***		0.0123***	0.0114***
		(0.00)	(0.00)		(0.02)	(0.01)		(0.00)	(0.00)
O_index $_{t}$	0.0125	0.0175	0.0143	0.0002	0.0001	0.0002	0.0010	0.0007	0.0009
	(0.30)	(0.14)	(0.24)	(0.56)	(0.73)	(0.50)	(0.23)	(0.38)	(0.26)
Leverage $_{t}$	-0.0301	-0.0273	-0.0275	0.0031***	0.0031***	0.0032***	0.0327***	0.0319***	0.0324***
	(0.11)	(0.15)	(0.15)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
ROA $_{t}$	3.8640***	3.7340***	3.7231***	0.2346***	0.2318***	0.2324***	-0.3045***	-0.2966***	-0.2961***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Book to market $_{t}$	0.5277***	0.5410***	0.5323***	0.0209***	0.0207***	0.0210***	-0.0177***	-0.0179***	-0.0178***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Total Assets (ln) $_{t}$	0.2118***	0.2048***	0.2080***	-0.0043***	-0.0042***	-0.0043***	-0.0055***	-0.0052***	-0.0055***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CFO (stand.dev.) $_{t}$	12.8623***	12.9886***	13.0657***	-0.0451	-0.0401	-0.0423	0.1339**	0.1296**	0.1242**
	(0.00)	(0.00)	(0.00)	(0.21)	(0.27)	(0.24)	(0.03)	(0.04)	(0.05)
Return $_{t}$	0.1351**	0.1433***	0.1428***	-0.0075***	-0.0074***	-0.0074***	0.0063	0.0059	0.0059
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.17)	(0.19)	(0.19)
Observations	*7251*	*7251*	*7251*	*6922*	*6922*	*6922*	*7564*	*7564*	*7564*
R^2	*0.062*	*0.065*	*0.066*	*0.085*	*0.086*	*0.087*	*0.046*	*0.048*	*0.048*

p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 reports univariate and multivariate results from the following OLS estimation model:

$$Manipulation_{it} = \alpha + \beta_1 Entrenchment_{i,t-1} + \beta_2 Corp\_Gov_{i,t-1} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

IS is income smoothing, computed as the reciprocal of the ratio of firm *i*'s standard deviation of net income before extraordinary items divided by beginning total assets, to its standard deviation of cash flow from operations divided by beginning total assets, calculated over rolling three-year windows; *DA* is discretionary accruals, computed through the forward-looking discretionary accruals model, as in Dechow et al. (2003); *RAM* is real activities manipulation, computed as the inverted sign of sales manipulation proxy (Roychowdhury, 2006), in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Entrenchment* is a composite measure that adds one for each observation in which the three dummy variables for entrenchment takes the value of 1; *Corp_gov* is a composite measure that adds one for each observation in which the three dummy variables for internal corporate governance characteristics takes the value of 1; *O_index* is computed as the difference between the *G-index* and the *E-index*; *Leverage* is the ratio between total liabilities and total assets. *ROA* is the ratio between income before extraordinary assets and beginning total assets; *Book to market* is is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *CFO (sd)* is the standard deviation of operating cash flows computed by using rolling firm-specific three-year windows; *Return* is the one-year holding period return of the investment in the common stock of firm *i*.

Table 4 – Panel A: The associations between subsequent operating performance and income smoothing

	ROA_{t+1}	ROA_{t+1}	ROA_{t+2}	ROA_{t+2}
Intercept	0.0567***	0.0464***	0.0487***	0.0402***
	(0.00)	(0.00)	(0.00)	(0.00)
IS_t	0.0024***	-0.0075***	0.0023***	-0.0060***
	(0.00)	(0.00)	(0.00)	(0.00)
ROA_t	0.2777***	0.2171***	0.1873**	0.1391*
	(0.00)	(0.01)	(0.02)	(0.05)
IS_t *ROA_t		0.1136***		0.0932***
		(0.00)		(0.00)
$Leverage_t$	-0.0049***	-0.0029***	-0.0044***	-0.0027***
	(0.00)	(0.00)	(0.00)	(0.00)
$Book\ to\ market_t$	-0.0450***	-0.0325***	-0.0417***	-0.0313***
	(0.00)	(0.00)	(0.00)	(0.00)
$Total\ Assets\ (ln)_t$	0.0018*	0.0027***	0.0038***	0.0045***
	(0.06)	(0.01)	(0.00)	(0.00)
$CFO\ (stand.dev.)_t$	-0.2622***	-0.2315***	-0.2896***	-0.2641***
	(0.00)	(0.00)	(0.00)	(0.00)
$Return_t$	0.0353***	0.0352***	0.0138***	0.0134***
	(0.00)	(0.00)	(0.00)	(0.00)
Observations	*10627*	*10627*	*10009*	*10009*
R^2	*0.282*	*0.315*	*0.156*	*0.179*

p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4, Panel A, reports results from the following OLS estimation models:

$$ROA_{i,t+j} = \alpha + \beta_1 Manipulation_{it} + \beta_2 ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

$$ROA_{i,t+j} = \alpha + \beta_1 Manipulation_{it} + \beta_2 ROA_{it} + \beta_3 Manipulation_{it} \times ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

ROA is income before extraordinary items, divided by beginning total assets; *IS* is income smoothing, computed as the reciprocal of the ratio of firm *i*'s standard deviation of net income before extraordinary items divided by beginning total assets, to its standard deviation of cash flow from operations divided by beginning total assets, calculated over rolling three-year windows; *Leverage* is the ratio between total liabilities and total assets; *Book to market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *CFO (sd)* is the standard deviation of operating cash flows computed by using rolling firm-specific three-year windows; *Return* is the one-year holding period return of the investment in the common stock of firm *i*.

Table 4 – Panel B: The associations between subsequent operating performance and discretionary accruals

	ROA_{t+1}	ROA_{t+1}	ROA_{t+2}	ROA_{t+2}
Intercept	0.0280***	0.0271***	0.0295***	0.0317***
	(0.00)	(0.00)	(0.00)	(0.00)
DA_t	-0.1875***	-0.1927***	-0.1364***	-0.1228***
	(0.00)	(0.00)	(0.00)	(0.00)
ROA_t	0.6429***	0.6464***	0.4714***	0.4625***
	(0.00)	(0.00)	(0.00)	(0.00)
DA_t *ROA_t		0.1637		-0.3842
		(0.56)		(0.19)
$Leverage_t$	-0.0008	-0.0008	-0.0008	-0.0008
	(0.30)	(0.31)	(0.36)	(0.33)
$Book\ to\ market_t$	-0.0217***	-0.0214***	-0.0215***	-0.0223***
	(0.00)	(0.00)	(0.00)	(0.00)
$Total\ Assets\ (ln)_t$	0.0005	0.0006	0.0022**	0.0021**
	(0.56)	(0.54)	(0.01)	(0.02)
$CFO\ (stand.dev.)_t$	-0.1522***	-0.1525***	-0.1666***	-0.1651***
	(0.00)	(0.00)	(0.00)	(0.00)
$Return_t$	0.0248***	0.0250***	0.0071**	0.0066**
	(0.00)	(0.00)	(0.02)	(0.03)
Observations	*9119*	*9119*	*7867*	*7867*
R^2	*0.407*	*0.408*	*0.232*	*0.233*

p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4, Panel B, reports results from the following OLS estimation models:

$$ROA_{i,t+j} = \alpha + \beta_1 Manipulation_{it} + \beta_2 ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

$$ROA_{i,t+j} = \alpha + \beta_1 Manipulation_{it} + \beta_2 ROA_{it} + \beta_3 Manipulation_{it} \times ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

ROA is income before extraordinary items, divided by beginning total assets; *DA* id discretionary accruals, computed through the forward-looking discretionary accruals model, as in Dechow et al. (2003); *Leverage* is the ratio between total liabilities and total assets; *Book to market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *CFO (sd)* is the standard deviation of operating cash flows computed by using rolling firm-specific three-year windows; *Return* is the one-year holding period return of the investment in the common stock of firm *i*.

Table 4 – Panel C: The associations between subsequent operating performance and real activities manipulation

	ROA_{t+1}	ROA_{t+1}	ROA_{t+2}	ROA_{t+2}
Intercept	0.0594***	0.0382***	0.0506***	0.0316***
	(0.00)	(0.00)	(0.00)	(0.00)
RAM_t	-0.0293***	-0.0109	-0.0187**	-0.0027
	(0.00)	(0.29)	(0.05)	(0.77)
ROA_t	0.2733***	0.4718***	0.1865**	0.3573***
	(0.00)	(0.00)	(0.03)	(0.00)
RAM_t *ROA_t		-0.1589***		-0.1331***
		(0.00)		(0.00)
$Leverage_t$	-0.0051***	-0.0025**	-0.0045***	-0.0024**
	(0.00)	(0.04)	(0.00)	(0.01)
$Book\ to\ market_t$	-0.0458***	-0.0316***	-0.0420***	-0.0295***
	(0.00)	(0.00)	(0.00)	(0.00)
$Total\ Assets\ (ln)_t$	0.0021**	0.0017*	0.0041***	0.0038***
	(0.03)	(0.05)	(0.00)	(0.00)
$CFO\ (stand.dev.)_t$	-0.2301***	-0.2179***	-0.2501***	-0.2416***
	(0.00)	(0.00)	(0.00)	(0.00)
$Return_t$	0.0356***	0.0310***	0.0139***	0.0099***
	(0.00)	(0.00)	(0.00)	(0.00)
Observations	*10744*	*10744*	*10123*	*10123*
R^2	*0.281*	*0.339*	*0.155*	*0.199*

p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4, Panel C, reports results from the following OLS estimation models:

$$ROA_{i,t+j} = \alpha + \beta_1 Manipulation_{it} + \beta_2 ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

$$ROA_{i,t+j} = \alpha + \beta_1 Manipulation_{it} + \beta_2 ROA_{it} + \beta_3 Manipulation_{it} \times ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

ROA is income before extraordinary items, divided by beginning total assets; *RAM* is real activities manipulation, computed as the inverted sign of sales manipulation proxy (Roychowdhury, 2006), in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Leverage* is the ratio between total liabilities and total assets; *Book to market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *CFO (sd)* is the standard deviation of operating cash flows computed by using rolling firm-specific three-year windows; *Return* is the one-year holding period return of the investment in the common stock of firm *i*.

Table 5: The associations between subsequent operating performance and CEOs' entrenchment

	ROA_{t+1}	ROA_{t+1}	ROA_{t+2}	ROA_{t+2}
Intercept	0.0379***	0.0417***	0.0389***	0.0412***
	(0.00)	(0.00)	(0.00)	(0.00)
$Entrenchment_t$	0.0032**	-0.0109**	0.0022	-0.0097***
	(0.04)	(0.05)	(0.22)	(0.01)
ROA_t	0.2220***	0.1389***	0.1271**	0.0605*
	(0.01)	(0.00)	(0.04)	(0.07)
$Entrenchment_t * ROA_t$		0.2115***		0.1732***
		(0.00)		(0.00)
O_index_t	0.0016***	0.0018***	0.0029***	0.0031***
	(0.00)	(0.00)	(0.00)	(0.00)
$Leverage_t$	-0.0066***	-0.0046***	-0.0059***	-0.0043***
	(0.00)	(0.00)	(0.00)	(0.00)
$Book\ to\ market_t$	-0.0719***	-0.0608***	-0.0656***	-0.0563***
	(0.00)	(0.00)	(0.00)	(0.00)
$Total\ Assets\ (ln)_t$	0.0058***	0.0046***	0.0054***	0.0046***
	(0.00)	(0.00)	(0.00)	(0.00)
$CFO\ (stand.dev.)_t$	-0.2038***	-0.1916***	-0.2095***	-0.1949***
	(0.00)	(0.00)	(0.00)	(0.00)
$Return_t$	0.0338***	0.0323***	0.0108***	0.0094***
	(0.00)	(0.00)	(0.00)	(0.00)
Observations	*8208*	*8208*	*7211*	*7211*
R^2	*0.275*	*0.307*	*0.147*	*0.173*

p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 reports results from the following OLS estimation models:

$$ROA_{i,t+j} = \alpha + \beta_1 Entrenchment_{it} + \beta_2 ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

$$ROA_{i,t+j} = \alpha + \beta_1 Entrenchment_{it} + \beta_2 ROA_{it} + \beta_3 Entrenchment_{it} \times ROA_{it} + \Sigma\beta_j Controls_{j,it} + \varepsilon_{it}$$

ROA is income before extraordinary items, divided by beginning total assets; *Entrenchment* is a composite measure that adds one for each observation in which the three dummy variables for entrenchment takes the value of 1; *Leverage* is the ratio between total liabilities and total assets; *Book to market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of firms' total assets; *CFO (sd)* is the standard deviation of operating cash flows computed by using rolling firm-specific three-year windows; *Return* is the one-year holding period return of the investment in the common stock of firm *i*.

Chapter 4 - Compensation Mechanisms, Accounting Choice, and Real Activities Manipulation

Abstract

CEO's compensation mechanisms represent an attempt to overcome the conflict of interests between owners and managers. However, in specific situations the implementation of these mechanisms is likely to lead CEOs to manipulate earnings. While previous literature has analyzed the association between only some compensation mechanisms and accounting manipulation, we attempt to consider both a broader set of compensation mechanisms, and different ways to manipulate earnings (i.e., both accounting and real activities manipulation). We find that the choice of different manipulation tools depends partially on the characteristics of CEO's compensation mechanisms. This implies that in specific situations, some compensation mechanisms, instead of reducing the agency problem by aligning the interests of CEOs to those of shareholders, may amplify it by affecting not only accounting quality but also efficient operational practices.

4.1. Introduction

Agency theory has dominated the analysis of corporate governance. Its main concern is the separation of ownership and control, and the possibility that managers (agents) take actions that hurt shareholders (principals). Managers may amass private benefits by building empires, maintaining costly labour, paying inflated transfer prices to affiliated entities, or simply exerting insufficient effort. In this context, a good governance structure is one that is able to align the interests of principals and agents. Shleifer and Vishny (1997) discussed the available mechanisms to force agents to internalize the welfare of shareholders, including managerial compensation mechanisms like stock options, annual bonuses, long-term incentive plans, equity stocks, and restricted stock grants.

In idiosyncratic situations, however, these compensation mechanisms may have the opposite effect of amplifying the agency problem. Some studies have pinpointed that, for example, managers may take advantage of the flexibility of accounting principles to influence reported earnings, thereby causing managerial compensation to be larger than it would otherwise be (Healy, 1985; Holthausen et al., 1995; Cheng and Warfield, 2005; Bergstresser and Philippon, 2006). These studies have focused on the relationship between particular compensation mechanisms - like stock options, annual bonuses or equity stocks - and accrual quality. However, they do not take into account the existence of other forms of manipulation. The associations between compensation mechanisms and earnings manipulation tools are important because each tool implies different consequences on firm value. In fact, while accounting manipulation satisfies both long-term (through income smoothing) and short-term (through discretionary accruals) objectives without affecting long-term firm value (Peasnell et al., 2000), real activities manipulation only achieves short-term objectives, as it has negative consequences on cash flows in future periods (Roychowdhury, 2006).

Acknowledging the different economic consequences of alternative forms of manipulation, the objective of this study is to analyze the impact of a broad set of compensation mechanisms - stock options, annual bonuses, long-term incentive plans, equity stocks, and restricted stock grants – on both accounting and real activities manipulations. These two tools of earnings manipulation differ in terms of the specific items to be managed and in their economic consequences. Accounting manipulation consists in the manipulation of accounting numbers to mislead users of financial statements either through the discretionary use of accruals (Dechow and Dichev, 2002) or by smoothing earnings (Fudenberg and Tirole, 1995). By manipulating accounting numbers, CEOs can achieve both long-term and short-term objectives through income

smoothing and discretionary accruals, respectively. Real activities manipulation is defined as “departures from normal operational practices, motivated by managers desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations” (Roychowdhury, 2006: 337). Because real activities manipulation affects long-term firm value, it is more likely to satisfy only CEOs’ short-term objectives. As each compensation mechanism is indexed on a particular facet of business performance, we expect that different compensation mechanisms will lead CEOs to manipulate earnings through different methods.

The hypotheses are defined by taking into account the characteristics of each compensation mechanism and the way they allow CEOs to increase their personal wealth by choosing a specific way to manipulate earnings. We argue that compensation mechanisms that limit CEOs’ loss from stock price declines, such as stock options, lead managers to engage in earnings manipulation tools that satisfy short-term objectives. CEOs with higher levels of stock options are then expected to engage not only in accounting manipulation, but also in real activities manipulation even at the expense of future cash flows, as they are not penalized as much as shareholders from a future firm value decrease. The compensation mechanisms that make CEOs’ wealth sensitive to firm value decreases (such as annual bonuses and equity stock) are likely to lead managers to engage in accounting manipulation, which temporarily affects earnings, but not firm value. Long-term incentives are expected to have a negative association with the manipulation of accruals, because the temporal increase of earnings obtained through this earnings manipulation tool is averaged away by the computation of the rolling-average cumulative performance, and with real activities manipulation, which implies a future firm value decrease and, therefore, a future CEO’s wealth decline. Finally, disentangling the final effect of restricted stock grants on earnings manipulation is an empirical issue, as the

incentive provided by this compensation mechanism to manipulate earnings depends on the combination of the CEO tenure with the date in which the restriction disappears.

Using data from Compustat and ExecuComp from 1992 to 2006, we obtain results that generally support the expectations. Stock options are generally positively associated with the earnings manipulation proxies. Equity stocks are positively related to accounting manipulation and, if observable heterogeneity is not considered, to real activities manipulation. Annual bonuses and long-term incentives are positively associated to discretionary accruals. Finally, restricted stock grants are not associated with any earnings manipulation tool.

The paper is organized as follows: The next section provides definitions and characteristics of the earnings manipulation tools. Section 3 develops the hypotheses. Section 4 introduces the data and describes the methodology. Section 5 presents the results. Section 6 concludes.

4.2. Earnings manipulation

Managers can uncover firms' performance by manipulating earnings in different ways. Next, we describe how managers can achieve their financial reporting goals through accounting manipulation and through the manipulation of real activities.

4.2.1. Accounting manipulation

Managers can manipulate accounting numbers through two different techniques: income smoothing, which mainly satisfies long-term objectives, and discretionary decisions about accruals, which are mainly addressed at achieving short-term financial reporting goals.

The accounting manipulation through income smoothing can be defined as the "process of manipulating the time profile of earnings or earnings reports to make the reported income stream less variable" (Fudenberg and Tirole, 1995: 75). To smooth income, managers decrease earnings in good years, and increase it in bad years. According to a survey conducted by Graham et al. (2005), executives engage in income smoothing because smoother earnings ease the analysts' task of predicting future earnings. Furthermore, in this survey CFOs argue that, in presence of smoother earnings, investors demand less risk premium, resulting in lower cost of equity and debt.

The accounting manipulation through discretionary accruals is the opportunistic use of accruals in order to achieve short-term objectives. Accrual accounting consists in "the accrual and deferral of past, current and anticipated future cash receipts and disbursements" (Richardson et al., 2005: 441). Through accruals, earnings better reflect the match between the timing of accounting recognition of operations with the timing of their economic benefits (Dechow and Dichev, 2002). As accruals are based on assumptions and estimates, they can be opportunistically managed to mislead users of financial statements (Jones, 1991; Dechow and Dichev, 2002). CEOs engage in discretionary accruals to achieve accounting targets that are implicitly or explicitly specified in a contract (Schipper, 1989). However, accruals can be opportunistically managed to mainly satisfy short-term objectives, as the effect of an increase of earnings through the manipulation of accruals must reverse some time in the future due to the self-reversing property of accruals.

4.2.2. Real activities manipulation

Prior literature has paid little attention to whether the existence of compensation mechanisms leads managers to engage in real activities manipulation, which is defined as

"departures from normal operational practices, motivated by managers desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations" (Roychowdhury, 2006: 337). For example, sales can be manipulated by offering more lenient credit terms. With this strategy, sales volume increases, but also credit risk. Also, managers can postpone the optimal level of discretionary expenses (such as R&D, advertising, and selling, general and administrative expenses) to increase current earnings, or produce more goods than necessary to lower fixed costs per unit (Roychowdhury, 2006). Real activities manipulation has the effect of reducing long-term firm's value. Therefore, managers would choose to engage in this kind of manipulation if they pursue only short-term objectives.

4.3. Hypotheses

In this section, we develop hypotheses about the relationship between the different ways to manipulate earnings and different mechanisms of CEO compensation: Stock options, annual bonuses, long-term incentive plans, equity stocks, and restricted stock grants. Table 1 summarizes the expected associations between compensation mechanisms and earnings manipulation tools that are developed in this section.

4.3.1. Stock options

Stock options are contracts that give to the recipient the right to buy a share of stock at a pre-specified exercise price for a pre-specified term (Murphy, 1999). Executive options typically become exercisable over time. For example, the 25% of stock options become exercisable in each of the four years following the grant. The main purpose of stock options is to align CEOs' interests to those of shareholders. However, the incentives from stock options do not mimic those of stock owners for several reasons (Murphy, 1999).

First, because option holders only gain from stock-price appreciation and not from total shareholder returns (which includes dividends), CEOs have incentives only in favouring share repurchases and not in increasing dividends. Second, since the value of options increases with stock-price volatility, executives with options have incentives to engage in riskier investments. Finally, the alignment between shareholders' and CEOs' interests totally disappears when the stock price falls below the exercise price, making the chance of exercising very little. For this last reason, option compensation makes CEO wealth a convex function of stock price (Burns and Kedia, 2006): Although CEOs' benefits from an increase in the stock price associated with aggressive accounting, losses in CEOs' wealth are limited after stock price declines. Management is rewarded in good times, but they are not equally penalized in bad times.

Stock options make CEOs more interested in short-term objectives, rather than in long-term objectives, as managers would not be penalized as much as shareholders from a decrease of long-term firm value. Therefore, we expect that CEOs are likely to engage in both discretionary accruals and real activities to increase stock price. With regards to income smoothing, the positive effect that smoother earnings have on option value is balanced by the increases of option value generated by stock price volatility. By taking into account these two opposite effects, we cannot determine an *ex-ante* relationship between stock options and income smoothing.

H1: Higher stock option incentives are positively associated with both discretionary accruals and real activities manipulation.

4.3.2. Annual bonuses

A bonus plan is normally composed of three components: Performance measures, performance standards and the structure of pay-performance relation (Murphy, 1999). The performance measure used to fix the target is normally an accounting measure, such as revenues, net income, pre-tax income. The performance standards vary from plan to plan, and it may consist, for example, in one-year budget goals, year-to-year improvements based on firm's results, standards discretionally fixed by the board of directors, or peer group standards. Finally, the pay-performance structure defines the performance threshold and the performance cap and, as a consequence, the amount to be paid to CEOs.

The annual bonus is a compensation mechanism that is normally set as a percentage of salary. If a pre-specified performance is lower (greater) than the target, then such a percentage tends to decrease (increase) proportionally to the negative (positive) difference between the performance and the target. Typically, there is a minimum threshold (expressed as a percentage of the performance measure) under which no bonus is paid. A maximum of bonus paid, also called bonus cap (again, expressed as a percentage of the performance measure), is also normally indicated.

Healy (1985) and Holthausen et al. (1995) show that annual bonuses lead managers to opportunistically engage in discretionary accruals in the case in which earnings are between the lower bound required to earn any bonus and the upper bound after which no further increases in bonuses are obtained. When earnings are below the lower bound, CEOs use to prefer either income smoothing or discretionary accruals. (Healy, 1985). If they engage in income smoothing, they are likely to decrease accruals in the current period and to increase them in the following period. In this way CEOs expect to gain no bonus in the current period and a greater bonus in the following period. If they opportunistically increase earnings through discretionary accruals, they can eventually reach a certain level of bonus in the current period. In the case in which earnings are above the upper bound,

they are likely to engage in income smoothing, so that they can increase income in future periods and receive their annual bonus even in presence of future bad performance. Therefore, in general, we expect a positive relation between annual bonuses and accounting manipulation. Depending on the position of earnings with respect to the minimum threshold and the bonus cap, CEOs may prefer to opportunistically manage accruals achieving long- or short-term objectives by smoothing income or by managing earnings upwards, respectively.

Finally, we expect a negative association between annual bonuses and real activities manipulation. If managers postpone the optimal amount of R&D, advertising, and selling, general and administrative expenditures, they are likely to reduce future earnings and the firms' stock price (Holthausen et al., 1995). Therefore, managers would have a trade-off between current bonus effects and future bonus effects.

H2: Higher annual bonus incentives are positively associated with both income smoothing and discretionary accruals, and negatively associated with real activities manipulation.

4.3.3. Long-term incentives

The structure of long-term incentives is similar to annual bonuses, but the long-term incentives are based on a rolling-average cumulative performance window that usually ranges between three and five years. Burns and Kedia (2006) argue that long-term incentive plans make CEO wealth a function of longer term firm value.

The association between long-term incentives and discretionary accruals is expected to be negative, as the temporal increase of earnings obtained through this earnings manipulation tool is averaged away by the computation of the rolling-average cumulative

performance. Also, we expect a negative association between long-term incentives and real activities manipulation. In fact, real activities manipulation has the effect of decreasing future firms' value and, therefore, the future pay-out of long-term incentives.

With regards to income smoothing, two opposite effects can influence managers' decisions to engage in this kind of manipulation. On the one hand, CEOs with greater long-term incentives are likely to engage in income smoothing to increase (decrease) earnings in bad (good) times, to reach low volatility of earnings and, therefore, to hit the pre-determined cumulative performance. On the other hand, , the interest of CEOs towards this kind of earnings manipulation depends on the width of the rolling-average window, as the longer the window, the smoother the cumulative performance, the less necessary the income smoothing. Due to these two opposite effects and to the fact that we cannot establish *a priori* which one prevails upon the other, we cannot determine an *ex-ante* relation between income smoothing and long-term incentives.

H3: Higher long-term incentives are negatively associated with both discretionary accruals and real activities manipulation.

4.3.4. Equity stocks

Equity stocks tie CEOs' wealth by exposing CEOs to price declines (Burns and Kedia, 2006). To avoid a wealth decrease from a decline in stock price, managers are likely to smooth earnings. Like shareholders, CEOs conceive income smoothing as a strategy to lower firm risk and, therefore, to decrease both cost of equity and cost of debt (Graham et al., 2005). Managers are also likely to opportunistically use accruals (Bergstresser and Philippon, 2006; Warfield et al., 1995), to temporarily increase share price without decreasing long-term firm's value. On the contrary, CEOs with a high percentage of equity

shares over their total compensation are not expected to engage in real activities manipulation as it directly affects firm's value and, therefore, share price and CEOs' future wealth.

H4: Higher equity stock incentives are positively associated with both income smoothing and discretionary accruals, and negatively associated with real activities manipulation.

4.3.5. Restricted stock grants

The stock provided to the executives is sometimes restricted, in the sense that it cannot be sold until certain conditions are met (Murphy, 1999). These conditions normally consist on employee longevity, but they may alternatively be concerned with earnings per share or internal financial targets. Once the restriction has been overcome, the stock has the same value as the market price of the stock.

The incentive provided by the restricted stock grants to manipulate earnings is not so straightforward, as it depends on the combination between CEO tenure and the date in which the restriction disappears. If CEOs are about to leave the firm and, at the same time, the restriction is about to be overcome, CEOs' interest in increasing earnings manipulation increases as well. If CEOs do not have the intention of leaving the firm soon and, at the same time, restricted stock grants are not going to be vested on the short-run, managers are less likely to manipulate earnings. Therefore, we do not predict any *ex-ante* relationship between restricted stock grants and earnings manipulation tools.

4.4. Data and methodology

4.4.1. Data

We collect financial data from the Compustat annual industrial and research files, excluding firms in regulated industries (SIC codes between 4400 and 5000), and financial institutions (SIC codes between 6000 and 6500). We also require that each firm-year observation has the data necessary to calculate all the earnings manipulation proxies.

Data about the compensation mechanisms are taken from the Compustat Executive Compensation (ExecuComp) dataset. These data are available only starting from 1992. We require that each observation has data about all the compensation mechanisms available. We winsorize variables at 1% and 99% as it is common to avoid outliers blurring the results. Thus, we obtain 13,364 firm-year observations from 1992 to 2006, corresponding to 1,647 different firms.

4.4.2. Research design

To test the hypotheses related to the associations between compensation mechanisms and earnings manipulation tools, we use the following specification:

$$MANIPULATION_{it} = \alpha + \Sigma\beta_k COMPENSATION_{k,it} + \Sigma\beta_j CONTROLS_{j,it} + u'_i + \varepsilon'_{it} \qquad (1)$$

We run the model for each firm *i* at the time *t*. The dependent variable (*MANIPULATION*) is estimated separately for three earnings manipulation proxies: income smoothing, discretionary accruals, and real activities manipulation. *COMPENSATION* includes the compensation mechanisms: stock options, annual bonuses, long-term incentives, equity stocks, and restricted stock grants. *CONTROLS* designates the control variables: leverage, ROA, book-to-market ratio, total assets, standard deviation of CFOs. Equation (1) describes a panel data fixed effects model, where the unobservable heterogeneity (u'_i) is taken into account (Bascle, 2008). In fact, we expect that there are

unobservable characteristics, such as firm culture and management ethics, that are determinants not only of manipulation, but also of compensation mechanisms. If these unobservable characteristics are not considered, compensation mechanisms may spuriously appear as a determinant of manipulation.

To further mitigate possible endogeneity problems, we extend Equation (1) by considering not only the unobservable, but also the observable characteristics that may affect both compensation mechanisms and earnings manipulation. Compensation mechanisms depend on corporate governance (Core et al., 1999; Mehran, 1995; Conyon, 1997; Cyert et al., 2002; Ryan and Wiggins, 2001), firm and environmental characteristics. Also, corporate governance characteristics have an effect on earnings quality (Klein, 2002; Xie et al., 2003; Ahmed and Duellman, 2007; Garcia Lara et al., 2009). To control for that, we add lagged variables of corporate governance characteristics to Equation (1). The full model is as follows:

$$MANIPULATION_{it} = \alpha + \Sigma\beta_k COMPENSATION_{k,it} + \Sigma\beta_u CORP\_GOV_{u,i,t-1} + \\ + \Sigma\beta_j CONTROLS_{j,it} + u'_i + \varepsilon'_{it}, \quad (2)$$

where *CORP_GOV* are the lagged variables that control for corporate governance characteristics. These variables are: CEO tenure, board independence, and non-duality.

4.4.3. The dependent variable: Earnings manipulation metrics

The variable *MANIPULATION* in Equations (1) and (2) is separately estimated for income smoothing, discretionary accruals, and real activities manipulation.

Income smoothing is measured by the ratio of firm *i*'s standard deviation of net income before extraordinary items (annual Compustat data item #18) divided by

beginning total assets (annual Compustat data item #6), to its standard deviation of cash flows from operations (annual Compustat data item #308) divided by beginning total assets (annual Compustat data item #6) (Francis et al., 2004) over rolling firm-specific three-year windows. According to this measure (*IS*), the smaller the ratio, the greater the income smoothing. To ease the interpretation, we use for our models the reciprocal of this measure (*R_IS*).

The proxy for discretionary accruals (*DA*) is based on the discretionary-accrual model introduced by Jones (1991). According to this model, total accruals are estimated as follows:

$$\frac{TA_{it}}{A_{i,t-1}} = \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \beta_1\left(\frac{\Delta REV_{it}}{A_{i,t-1}}\right) + \beta_2\left(\frac{PPE_{it}}{A_{i,t-1}}\right) + \varepsilon_{it}, \qquad (3)$$

where *i* indicates the firm, *t* the year, *TA* represents total accruals, calculated as the difference between net income before extraordinary items and cash flows from operations (annual Compustat data item #18 – annual Compustat data item #308), *A* are total assets (annual Compustat data item #6), *ΔREV* is the change in net sales (annual Compustat data item #12), and *PPE* is gross property, plant and equipment (annual Compustat data item #7). The estimation is run for all firms in each industry through its 2-digit SIC code and for each year *t*. In our model, we use the absolute value of the residuals (*ABS_DA*), which represent the firm-specific discretionary portion of total accruals.

Finally, our proxy of real activities manipulation is a measure of sales manipulation. Following Dechow et al. (1998) and Roychowdhury (2006), normal cash flow from operations can be expressed as a linear function of sales and changes

in sales in the current period. The model can be then estimated through the following cross-sectional regression:

$$\frac{CFO_{it}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \beta_1\left(\frac{S_{it}}{A_{i,t-1}}\right) + \beta_2\left(\frac{S_{it} - S_{i,t-1}}{A_{i,t-1}}\right) + \varepsilon_{it}, \quad (4)$$

where *CFO* is cash flow from operations (Compustat data item #308), *A* is total assets (annual Compustat data item #6), and *S* is sales (annual Compustat data item #12). This model is estimated for each year *t* and for every industry classified by its 2-digit SIC code. Our measure of real activities manipulation (RAM) is the abnormal CFOs, which are calculated as the difference between the actual values and those from equation (4). That is, our proxy for real activities manipulation (*RAM*) is the residuals from Equation (4).

According to Roychowdhury (2006), firms that attempt to temporarily increase sales volume, for example by offering more lenient credit terms, present CFOs that are unusually lower than the rest of the firms. This would lead to negative values of *RAM*, that is, to observed CFOs that are lower than predicted by the model. Given this, smaller values of *RAM* mean that CEOs engage in real activities manipulation more. To ease the interpretation, we use in our models the inverted sign of *RAM* (*I_RAM*), so that our proxy for the manipulation of real activities is increasing with the level of manipulation.

The residuals from Equation (4) can also be capturing the effects of the manipulation of discretionary expenses. Thus, we attempt to disentangle the effects of sales manipulation on CFOs from those of discretionary expenses manipulation. Reducing in an opportunistic way discretionary expenses has a positive effect on

current CFOs, possibly at the expense of future cash flows. In Equation (4), this opportunistic decrease in discretionary expenses contributes to observed CFOs being higher than the estimation, leading to positive residuals. To avoid capturing these two opposite effects that sales manipulation and discretionary expenses manipulation have on CFOs, we first compute discretionary expenses as the sum of advertising expenses (annual Compustat data item #45), R&D expenses (annual Compustat data item #46), and selling, general and administrative (SG&A) expenses (annual Compustat data item #189). If SG&A expenses are available, advertising and R&D expenses are set equal to zero if they are missing (Cohen et al, 2008). We consider SG&A expenses as a discretionary expenditure because we assume that this item mainly includes discretionary expenses, such as employee training, maintenance and travel, that generate cash outflows (Roychowdhury, 2006).

We then compute the medians by year and by sector of the discretionary expenses scaled by beginning total assets and then calculate the difference between these medians and the discretionary expenses scaled by beginning total assets of each firm-year observation. We then add this difference to CFOs scaled by beginning total assets and rerun Equation (4). In this way, the residuals identify sales manipulation without considering the increasing effects that the manipulation of discretionary expenses has on CFOs. As in *I_RAM*, we follow the interpretation according to which firms with negative abnormal CFOs are those that engage in sales manipulation. To ease the interpretation, we multiply the residuals by minus one. This modified version of the model of Roychowdhury (2006) represents our second proxy of real activities manipulation (*M_RAM*).

4.4.4. Compensation mechanisms metrics

The compensation mechanisms that we consider are base salaries, unexercisable and exercisable unexercised options, annual bonuses, long-term incentives, restricted stock grants and stock holdings. Each compensation mechanism is scaled by the sum of all the mechanisms listed above. We measure each mechanism as follows.

Base salaries are represented by the dollar value of the base salary earned by the CEO during the fiscal year. Annual bonuses are computed as the dollar value of bonuses earned by the CEO during the fiscal year. Long-term incentives are calculated as the amount paid to the CEO under the company's long term incentive plans, which take into account a period of more than one year. Options, equity and restricted stocks are computed, in a first stage, by considering the sum between the aggregate number of unexercised options held by the CEOs at fiscal year that were not yet vested, and the aggregate number of unexercised options held by executives at fiscal year end that were vested, the number of shares owned by CEOs, and the aggregate shares of restricted stock held by the CEOs as of fiscal year end. Following Bergstresser and Philippon (2006), we multiply, in a second stage, the number of options, shares, and restricted stock, by the share price.

4.4.5. Control variables

Earnings manipulation is partly determined by factors different from compensation mechanisms. For this reason, we include in our models several control variables.

Firms are likely to engage in earnings manipulation to control for debt contracting issues (DeFond and Jimbalvo, 1994; Minton and Schrand, 1999). To take into account firms' financial structure, we use leverage, computed as the ratio of total liabilities to total assets. According to Kothari, Leone and Wasley (2005), accounting manipulation is misspecified when firms' performance is not considered. We thus include ROA, measured

as the ratio of income before extraordinary items to beginning total assets. Growth opportunities incentivize firms to manipulate earnings because earnings surprises are perceived in a special negative way from analysts for this kind of companies (Graham et al., 2005; Skinner and Sloan, 2002). We measure growth opportunities through the book-to-market ratio. Larger firms face more political costs (Watts and Zimmermann, 1990) and are likely to manipulate earnings to reduce undesired visibility. We measure firm size through the logarithm of total assets. Finally, riskier firms are expected to manipulate earnings more in order to cover their real risk. We proxy for risk by computing the standard deviation of CFO over three-year rolling windows.

As explained in the "Research design" Section, we include in Equation (2) other control variables that describe corporate governance characteristics.

a) *CEO tenure*: CEO tenure is expected to affect compensation mechanisms. Older and younger CEOs are more likely to exacerbate the agency problem (Dechow and Sloan, 1991; Hirshleifer, 1993), as the oldest ones tend to maximize their wealth before retirement, and the youngest ones tend to focus on short-term goals to build up their reputation. CEOs that are neither among the younger nor among the older ones are expected to have fewer conflicts. The relation between CEO tenure and compensation mechanisms is then likely to be concave and the sign is uncertain. With respect to the association between CEO tenure and earnings manipulation, previous literature (Fredrickson et al. 1988) observed that the early vulnerability CEOs are subject to corresponds to their first three year, or less, in the firm. We then expect that CEOs act more in the interest of shareholders during their first years in the firm, and that the agency cost increases in later years. We can then argue that the longer the CEO tenure, the higher the earnings manipulation.

b) *Board independence*: Effective monitoring reduces the need for incentive alignment (Ryan and Wiggins III, 2001) and the manipulation of earnings (Klein, 2002; Xie et al., 2003; Ahmed and Duellman, 2007; Garcia Lara et al., 2009). We measure board independence as the ratio of the number of executives that are not members of the board, to the total number of executives.

c) *CEOs' non-duality*: The separation between CEO and chair of the board reduces CEO's opportunistic behaviour (Jensen and Meckling, 1976; Ryan and Wiggins III, 2001). Non-duality implies closer monitoring of executives. For this reason, it is likely to reduce earnings manipulation and also the need of compensation mechanisms to align CEOs' and shareholders' interests (Ryan and Wiggins III, 2001). We measure non-duality through a dummy variable that takes the value of 1 if the same person does not hold both the CEO and the chairman positions, and 0 otherwise.

4.5. Results

4.5.1. Descriptive statistics

Table 2 reports the descriptive statistics for manipulation proxies and for compensation mechanisms. *R_IS* has a mean of 2.1654, indicating that, on average, the variability in net income is greater than the variability in operating cash flows. Its median is equal to 1.3344, which means that the variable is skewed right. *R_IS* is the reciprocal of the ratio between the variability of the standard deviation of net income before extraordinary items divided by beginning total assets, and the standard deviation of cash flow from operations divided by beginning total assets (*IS*). The mean of *IS* is equal to 1.1666, and its median is equal to 0.7494. Both mean and medians fit well with previous literature (Zarowin, 2002). The absolute value of discretionary accruals (*ABS_DA*) is 0.0460. This value is greater

than the mean of the signed discretionary accruals (*DA*), which is equal to 0.0023. The difference between the signed and the absolute values is explained by the fact that, by taking absolute values, the mean shifts to the right. The real activities manipulation proxy (*I_RAM*), calculated as the inverted sign of the sales manipulation proxy (*RAM*), has a mean close to zero (-0.0037), which is consistent with previous literature (Roychowdhury, 2006). With respect to compensation mechanisms, options and shares are largely used, whilst long-term incentives are adopted by few firms. In terms of values, stock options have the greatest mean (0.5349) and median (0.6062), followed by equity stocks, which have a mean of 0.3661 and a median of 0.2520. Long-term incentives report the smallest values of the mean (0.0040). The greater use of stock options and equity stock, and the little presence of long-term incentives, is also confirmed by computing the percentages of observations that report a value greater than zero for each compensation mechanism. Only the 12.10% of observations in the sample provides to CEOs long-term incentives with a value greater than zero. Option values are greater than zero in the 92.90% of observations, and equity stock values have a percentage equal to 97.50%. Finally, 78.81% of observations have annual bonus values greater than zero, and 29.44% of the total has restricted stock grant values greater than zero.

Table 3 reports pairwise Spearman (below the diagonal) and Pearson (above the diagonal) correlations for manipulation proxies. The correlation between the absolute values of discretionary accruals and the inverse of the adjusted sales manipulation is significantly positive. According to Roychowdhury (2006), this can be for two reasons. First, firms engaging in accounting manipulation also engage in real activities manipulation Second, some manipulation strategies, such as overproduction, have a positive effect on accruals, but a negative effect on cash flow from operations. The correlation between real activities manipulation and stock options is negative and not

significant in the case of *I_RAM*, and it is positive and significant for *M_RAM*. Most of the correlations between *M_RAM* and the rest of compensation mechanisms are negative and significant. The correlation between stock options and equity shares is high in both the Spearman and the Pearson correlations. This implies a possible multicollinearity problem, confirmed by a Variance Inflation Factor (VIF) equal to 17.05 for equity shares, and to 16.44 for stock options. However, multicollinearity does not represent a problem for our analysis, as it has the effect of decreasing the probability that a coefficient is significant (Maddala, 2001). If the regression coefficients are significant, high correlation between independent variables should not be concerned.

4.5.2. Determinants of earnings manipulation

Results from Equation (1) are reported in Table 4. The Hausman test confirms that the fixed effect model is more appropriate than the random effect.

Stock options are positively and significantly associated with discretionary accruals. The relation between stock options and the variable *I_RAM* is not significant. However, if we consider *M_RAM* as a proxy for real activities manipulation, the association becomes positive and significant. Therefore, hypothesis *H1* is confirmed for both discretionary accruals and real activities manipulation, if *M_RAM* is taken into account. The positive sign obtained in *R_IS* can be explained by arguing that the positive effect on CEO's wealth from an increase in option value through smoother earnings is greater than the one generated by an increase of the option value due to stock price volatility. Annual bonuses and long-term incentives have significant associations with discretionary accruals. In this case, the relations are positive. Hypothesis *H2* is then partially confirmed, whilst hypothesis *H3* is not confirmed, as the relation between long-term incentives and discretionary accruals was expected to be negative. Equity stock is positively associated

both with income smoothing and with discretionary accruals, as well as with real activities manipulation. The relation between equity stock and real activities manipulation is positive and significant if both *I_RAM* and *M_RAM* are used. Thus, hypothesis *H4* is supported in the case of income smoothing and discretionary accruals, but not in the case of real activities manipulation. Finally, restricted stock grants do not have significant relations with any of the manipulation proxies.

Table 5 reports results from Equation (2), where both unobservable and observable heterogeneity are taken into account. Also for this model, the Hausman test rejects the null hypothesis, suggesting that the fixed effect is more appropriate than the random effects.

Stock options are positively associated both with discretionary accruals and with real activities manipulation, in the case in which the proxy *M_RAM* is used. Also, the association between stock options and income smoothing is positive and significant, meaning that the positive effects of smoothing incomes on stock options value are perceived by CEOs as greater than the negative effects. Annual bonuses and long-term incentives have significant associations only with discretionary accruals. The positive relation between annual bonuses and discretionary accruals partially supports hypothesis *H2*, whilst the positive association between long-term incentives and discretionary accruals do not confirms the expectations in hypothesis *H3*. Equity stock is positively associated with both income smoothing and discretionary accruals. Its association with real activities manipulation is positive and significant for *I_RAM*, and positive but not significant for *M_RAM*. Finally, restricted stock grants do not report any significant association.

With regards to observable firms' characteristics related to corporate governance, we observe that the relation between board independence and the absolute value of discretionary accruals is negative and significant, confirming the findings of previous

literature (Klein, 2002; Xie et al., 2003; Ahmed and Duellman, 2007; Garcia Lara et al., 2009). The association between board independence and real activities manipulation is not significant neither for *I_RAM* nor for *M_RAM*. Finally, non-duality is significantly and negatively related to both *R_IS* and *ABS_DA*, but positively related to *M_RAM*.

The hypotheses about the associations between compensation mechanisms and earnings manipulation tools are generally supported when corporate governance characteristics are included in the model. Some of the corporate governance characteristics that normally reduce discretionary accruals (i.e., board independence and non-duality) do not avoid the positive relationship between some compensation mechanisms (i.e., stock options) and real activities manipulation. Corporate governance characteristics reduce the problem of accounting manipulation but increase the one of real activities manipulation.

4.5.3. Sensitivity checks

Results presented in Table 5 are generally robust to alternative measures of earnings manipulation proxies. We alternatively measure income smoothing as the correlation between changes in accounting accruals and changes in operating cash flows (Leuz et al., 2003). To calculate this, we use rolling firm-specific three-year windows. The expected sign of this correlation is negative (Dechow, 1994), and larger magnitudes of the negative correlation indicate smoothing of reported earnings that does not reflect the actual economic performance (Leuz et al., 2003). To ease the interpretation of our second proxy of income smoothing, we multiply the correlation by (-1), so that the greater the value, the smoother the income. By using this proxy in Equation (2) instead of *R_IS*, results are similar. The only difference with respect to the results obtained by using *R_IS* is represented by the association between income smoothing and stock options, which do not have a significant coefficient. As an alternative proxy of discretionary accruals, we use the

modified Jones model (Dechow et al., 1995). The only difference with the Jones model is that changes in revenues in Equation (3) are adjusted for the change in accounting receivable in the event period. Also for this proxy, we consider the absolute values of the residuals. By using this proxy as the dependent variable in Equation (2), results remain substantially the same.

To control for aggregate fluctuations, we include year dummies in Equation (2). Results generally remain stable. The only difference is given by the association between restricted stock grants and discretionary accruals, which is positive and significant at the 10% level.

4.6. Summary and conclusions

By analyzing the impact of a broad set of compensation mechanisms on alternative forms of manipulation, the paper sheds light on the undesired impacts that CEO's compensation mechanisms have not only on accounting numbers, but also on real activities and, as a consequence, on future firms' value. Results show that compensation mechanisms such as stock options, instead of reducing the agency problem by aligning the interests of CEOs to those of shareholders, tend to amplify it by affecting both accounting quality and efficient operational practices. Annual bonuses and long-term incentives are likely to lead managers to manipulate accounting numbers through discretionary accruals. CEOs with greater percentages of annual bonuses and long-term incentives over their total compensation are more interested in short-term objectives. However, managers are expected to achieve them by manipulating accounting numbers, rather than real activities. In this way, they temporarily increase earnings without directly affecting future firms' value and, consequently, managers' wealth. Equity stocks are positively associated with both income smoothing and discretionary accruals. The relation between equity stocks and

real activities manipulation is spurious, as it is positive and significant when unobservable firms' characteristics are considered, and not significant when also observable characteristics are taken into account. Finally, restricted stock grants do not have any relation with the manipulation proxies.

We find evidence that compensation mechanisms, which are introduced to minimize the agency problem, can exacerbate it in peculiar situations. Compensation mechanisms can lead CEOs to distort firms' performance not only through accounting manipulation, but also through real activities manipulation. As a consequence, an increase in performance-based compensation implies not only a greater use of discretionary accruals, but also the manipulation of operational activities that lead to a decrease of long-term firm value. We do not believe that compensation mechanisms necessarily destroy value, but we argue that the mix of compensation mechanisms provided to CEOs needs to be carefully structured so that their drawbacks in terms of earnings manipulation do not increase the agency costs, rather than decrease them.

Further research can explore the moderating roles of corporate governance characteristics on the associations between compensation mechanisms and earnings manipulation tools. Stronger corporate governance characteristics can affect CEOs' decision about which earnings manipulation tool can be used to achieve their personal goals. In fact, stronger corporate governance, which is expected to decrease the agency problem, may lead managers to prefer real activities manipulation to accounting manipulation, as the distortion of operational activities is more difficult to be detected. In this case, corporate governance can modify CEOs' preferences about the earnings manipulation tools to maximize their wealth, and can further exacerbate the conflict of interests between managers and shareholders.

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Table 1 – Expected associations between compensation mechanisms and earnings manipulation tools

	Income smoothing	Discretionary accruals	Real activities manipulation
Stock options	?	+	+
Annual bonuses	+	+	-
Long-term incentives	?	-	-
Equity stocks	+	+	-
Restricted stock grants	?	?	?

Table 2 – Descriptive statistics

Variables	25th percentile	Mean	Median	75th percentile	Standard deviation
IS	0.3972	1.1666	0.7494	1.3809	1.3386
R_IS	0.7242	2.1654	1.3344	2.5178	2.5425
DA	-0.0271	0.0023	0.0022	0.0354	0.0660
ABS_DA	0.0131	0.0460	0.0316	0.0619	0.0473
RAM	-0.0378	0.0037	0.0003	0.0438	0.0764
I_RAM	-0.0438	-0.0037	-0.0003	0.0378	0.0764
M_RAM	-0.1048	-0.0063	-0.0065	0.0785	0.1709
Stock options	0.2733	0.5349	0.6062	0.8026	0.3102
Bonus	0.0012	0.0234	0.0122	0.0287	0.0419
Long-term incentives	0	0.0040	0	0	0.0195
Equity shares	0.1003	0.3661	0.2520	0.6109	0.3192
Restricted stock grants	0	0.0254	0	0.0146	0.0624

IS is income smoothing, computed as the ratio of firm *i*'s standard deviation of net income before extraordinary items divided by beginning total assets, to its standard deviation of cash flow from operations divided by beginning total assets, calculated over rolling three-year windows; *R_IS* is the reciprocal of *IS*; *DA* is accounting manipulation, measured by the discretionary accruals computed as in the Jones model; *ABS_DA* is the absolute value of *DA*; *RAM* is real activities manipulation, measured as the residuals of the model of Roychowdhury; *I_RAM* is the inverted sign of *RAM*; *M_RAM* is the modified version of the model of Roychowdhury for sales manipulation, in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Stock options* is the product of share price with the sum of the aggregate number of unexercised unexercisable options and the aggregate number of unexercised exercisable options; *Bonus* is the dollar value of annual bonus earned during fiscal year; *Long-term incentives* is the dollar value of long-term incentives earned during fiscal year; *Equity shares* is the product of share price with the number of shares earned by CEOs; *Restricted stock grants* is the product of share price with the aggregate number of shares of restricted stock held by CEOs as of fiscal year end.

Table 3 – Correlation matrix

	R_IS	ABS_DA	I_RAM	M_RAM	Stock options	Bonus	Long-term incentives	Equity shares	Restricted stock grants	ROA	Total assets (ln)
R_IS	1	-0.0191	-0.0090	**-0.0532**	**-0.0662**	0.0210	0.0062	**0.0737**	-0.0062	**0.1536**	0.0113
ABS_DA	**-0.0465**	1	**0.0509**	**0.0530**	0.0138	-0.0101	**-0.0327**	-0.0101	**-0.0615**	**-0.1841**	**-0.1852**
I_RAM	**-0.0369**	**0.0462**	1	**0.3190**	-0.0120	**0.0288**	0.0013	**-0.0298**	**0.0293**	**-0.4417**	**-0.0245**
M_RAM	**-0.0704**	**0.0303**	**0.3017**	1	**0.0697**	**-0.0227**	-0.0112	**-0.0661**	**-0.0232**	**-0.1632**	**-0.0487**
Stock options	**-0.0913**	**0.0261**	-0.0165	**0.0685**	1	**-0.0310**	-0.0218	**-0.9155**	**-0.1084**	**-0.0638**	**0.1850**
Bonus	**0.0767**	**-0.0565**	-0.0138	**-0.0329**	**0.1550**	1	**0.1199**	**-0.2109**	**0.0472**	-0.0219	-0.0057
Long-term incentives	**0.0435**	**-0.0786**	-0.0145	**-0.0234**	**0.0349**	**0.1506**	1	**-0.0677**	**0.0423**	0.0071	**0.1275**
Equity shares	**0.1080**	**-0.0245**	**-0.0325**	**-0.0735**	**-0.8990**	**-0.2798**	**-0.0596**	1	**-0.1001**	**0.1366**	**-0.1671**
Restricted stock grants	0.0056	**-0.0755**	**0.0338**	-0.0152	**-0.0461**	**0.1603**	**0.1424**	**-0.0624**	1	-0.0012	**0.1801**
ROA	**0.2195**	**-0.0582**	**-0.4265**	**-0.1183**	**-0.0583**	**0.1032**	**0.0516**	**0.1408**	-0.0145	1	**0.0947**
Total assets (ln)	**0.0264**	**-0.1704**	-0.0183	**-0.0437**	**0.1703**	**0.1103**	**0.2557**	**-0.1299**	**0.3010**	-0.0014	1

Correlations in bold are significant at the 1% level.

Pairwise Spearman (below the diagonal) and Pearson (above the diagonal) correlations for manipulation proxies. *R_IS* is the reciprocal of the proxy of income smoothing, computed as the reciprocal of the ratio of firm *i*'s standard deviation of net income before extraordinary items divided by beginning total assets, to its standard deviation of cash flow from operations divided by beginning total assets, calculated over rolling three-year windows; *ABS_DA* is the absolute value of the accounting manipulation proxy, measured by the discretionary accruals computed as in the Jones model; *I_RAM* is the inverted sign of the real activities manipulation proxy, measured through the residuals of the model of Roychowdhury. *M_RAM* is the modified version of the model of Roychowdhury for sales manipulation, in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation. *Stock options* is the product of share price

with the sum of the aggregate number of unexercised unexercisable options and the aggregate number of unexercised exercisable options; *Bonus* is the dollar value of annual bonus earned during fiscal year; *Long-term incentives* is the dollar value of long-term incentives earned during fiscal year; *Equity shares* is the product of share price with the number of shares earned by CEOs; *Restricted stock grants* is the product of share price with the aggregate number of shares of restricted stock held by CEOs as of fiscal year end; *Leverage* is the ratio between total liabilities and total assets; *ROA* is the ratio between income before extraordinary assets and beginning total assets; *Total assets (ln)* is the natural logarithm of total assets;

Table 4 – The impact of compensation mechanisms on manipulation proxies

	Accounting manipulation				Real activities manipulation		
	Income smoothing		*Discretionary accruals*		*Sales manipulation*		
	Expected sign	R_IS	Expected sign	ABS_DA	Expected sign	I_RAM	M_RAM
Intercept		0.2319		0.0457***		-0.0306***	-0.0694***
		(0.54)		(5.64)		(2.80)	(3.59)
Stock options $_t$	?	0.7931**	+	0.0149**	+	0.0097	0.0306**
		(2.45)		(2.45)		(1.18)	(2.11)
Bonus $_t$	+	0.4428	+	0.0312**	-	-0.0116	0.0095
		(0.61)		(2.29)		(0.63)	(0.29)
Long-term incentives $_t$	?	0.3720	-	0.0441**	-	-0.0255	0.0344
		(0.31)		(1.97)		(0.84)	(0.64)
Equity stock $_t$	+	0.9660***	+	0.0183***	-	0.0150*	0.0280*
		(3.01)		(3.04)		(1.85)	(1.95)
Restricted stock $_t$	?	0.7408	?	0.0110	?	0.0108	0.0298
		(1.42)		(1.13)		(0.81)	(1.27)
Leverage $_t$		-0.6590***		0.0076**		0.0257***	0.0471***
		(3.63)		(2.23)		(5.61)	(5.80)
ROA $_t$		3.4535***		-0.0845***		-0.2618***	-0.2809***
		(11.43)		(14.92)		(34.27)	(20.77)
Book-to-Market $_t$		-0.0025		-0.0002*		0.0001	0.0001
		(0.45)		(1.92)		(0.71)	(0.49)
Total assets (ln) $_t$		0.0828*		-0.0031***		0.0029**	0.0042**
		(1.80)		(3.65)		(2.47)	(2.03)
CFO (stand.dev.) $_t$		15.7786***		0.1642***		-0.0622***	-0.0654**
		(23.77)		(13.20)		(3.70)	(2.20)
Hausman test		102.25		52.01		107.36	42.87
Effects		Fixed effect model		Fixed effect model		Fixed effect model	Fixed effect model
R^2		*0.0598*		*0.0420*		*0.1150*	*0.0500*
Observations		*13,364*		*13,364*		*13,364*	*13,364*

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 4 reports the results from the following panel data fixed effect model, which controls for unobservable heterogeneity:

$$MANIPULATION_{it} = \alpha + \Sigma\beta_k COMPENSATION_{k,it} + \Sigma\beta_j CONTROLS_{j,it} + u'_i + \varepsilon'_{it}$$

R_IS is the reciprocal of the proxy for income smoothing, computed as the reciprocal of the ratio of firm *i*'s standard deviation of net income before extraordinary items divided by beginning total assets, to its standard deviation of cash flow from operations divided by beginning total assets, calculated over rolling three-year windows; *ABS_DA* is the absolute value of the accounting manipulation proxy, measured by the discretionary accruals computed as in the Jones model; *I_RAM* is the inverted sign of the real activities manipulation proxy, measured as the residuals of the model of Roychowdhury; *M_RAM* is the modified version of the model of Roychowdhury for sales manipulation, in which the CFOs scaled by beginning

total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Stock options* is the product of share price with the sum of the aggregate number of unexercised unexercisable options and the aggregate number of unexercised exercisable options; *Bonus* is the dollar value of annual bonus earned during fiscal year; *Long-term incentives* is the dollar value of long-term incentives earned during fiscal year; *Equity shares* is the product of share price with the number of shares earned by CEOs; *Restricted stock grants* is the product of share price with the aggregate number of shares of restricted stock held by CEOs as of fiscal year end; *Leverage* is the ratio between total liabilities and total assets; *ROA* is the ratio between income before extraordinary assets and beginning total assets; *Book-to-market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of total assets; *CFO (stand.dev)* is the standard deviation of operating cash flows computed by using rolling firm-specific three-year windows.

Table 5 - The impact of compensation mechanisms on manipulation proxies by using lagged variables related to corporate governance characteristics

	Accounting manipulation				Real activities manipulation		
	Income smoothing		*Discretionary accruals*		*Sales manipulation*		
	Expected sign	R_IS	Expected sign	ABS_DA	Expected sign	I_RAM	M_RAM
Intercept		0.1616		0.0531***		-0.0491***	-0.0751***
		(0.31)		(5.37)		(3.70)	(3.25)
Stock options $_t$	?	0.7467**	+	0.0172**	+	0.0106	0.0352**
		(2.05)		(2.48)		(1.15)	(2.18)
Bonus $_t$	+	-0.1487	+	0.0379**	-	-0.0179	-0.0034
		(0.18)		(2.48)		(0.87)	(0.10)
Long-term incentives $_t$	?	-0.3594	-	0.0462*	-	-0.0086	0.0610
		(0.29)		(1.95)		(0.27)	(1.10)
Equity stock $_t$	+	0.7182**	+	0.0191***	-	0.0158*	0.0255
		(1.98)		(2.77)		(1.71)	(1.59)
Restricted stock $_t$	?	0.6484	?	0.0133	?	0.0244	0.0422
		(1.11)		(1.20)		(1.64)	(1.62)
CEO tenure $_{t-1}$		0.0016		-0.0001		-0.0002	0.0001
		(0.29)		(1.14)		(1.50)	(0.39)
Board independence $_{t-1}$		0.1035		-0.0071*		0.0073	0.0071
		(0.49)		(1.78)		(1.37)	(0.76)
Non-duality $_{t-1}$		-0.1566**		-0.0048***		-0.0007	0.0078**
		(2.16)		(3.49)		(0.39)	(2.43)
Leverage $_t$		-0.9043***		0.0083**		0.0302***	0.0616***
		(4.16)		(2.02)		(5.45)	(6.37)
ROA $_t$		3.2955***		-0.0948***		-0.2796***	-0.2684***
		(9.54)		(14.46)		(31.76)	(17.51)
Book-to-Market $_t$		-0.0033		-0.0002		0.0001	0.0001
		(0.59)		(1.47)		(0.80)	(0.49)
Total assets (ln) $_t$		0.1195**		-0.0034***		0.0045***	0.0021
		(2.10)		(3.14)		(3.07)	(0.82)
CFO (stand.dev.) $_t$		16.2606***		0.1630***		-0.0725***	-0.0419
		(21.58)		(11.39)		(3.77)	(1.25)
Hausman test		118.06		54.91		80.77	35.90
Effects		Fixed effect model		Fixed effect model		Fixed effect model	Fixed effect model
R^2		*0.0621*		*0.0493*		*0.1304*	*0.0514*
Observations		*10,468*		*10,468*		*10,468*	*10,468*

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 5 reports the results from the following panel data fixed effect model, which controls for both unobservable and observable heterogeneity:

$$MANIPULATION_{it} = \alpha + \Sigma\beta_k COMPENSATION_{k,it} + + \Sigma\beta_u CORP\_GOV_{u,i,t-1} + \Sigma\beta_j CONTROLS_{j,it} + u'_i + \varepsilon'_{it}$$

R_IS is the reciprocal of the proxy of income smoothing, computed as the reciprocal of the ratio of firm *i*'s standard deviation of net income before extraordinary items divided by beginning total assets, to its standard deviation of cash flow from operations divided by beginning total assets, calculated over rolling three-year windows; *ABS_DA* is the absolute value of the accounting manipulation proxy, measured by the discretionary accruals computed as in the Jones model; *I_RAM* is the inverted sign of the real activities manipulation proxy, measured through the residuals of the model of Roychowdhury; *M_RAM* is the modified version of the model of Roychowdhury for sales manipulation, in which the CFOs scaled by beginning total assets used to run the model are equal to the sum between the original CFOs scaled by beginning total assets, and the difference between the median by year and by sector of discretionary expenses scaled by beginning total assets and discretionary expenses scaled by beginning total assets of each firm-year observation; *Stock options* is the product of share price with the sum of the aggregate number of unexercised unexercisable options and the aggregate number of unexercised exercisable options; *Bonus* is the dollar value of annual bonus earned during fiscal year. *Long-term incentives* is the dollar value of long-term incentives earned during fiscal year; *Equity shares* is the product of share price with the number of shares earned by CEOs; *Restricted stock grants* is the product of share price with the aggregate number of shares of restricted stock held by CEOs as of fiscal year end; *CEO tenure* is the number of years in which executives served as CEOs for all or most of each fiscal year; *Board independence* is 1 minus the ratio of the number of executives serving as directors, to the total number of executives; *Non-duality* is a dummy variable that takes the value of 1 if the same person does not hold both the CEO and the chairman positions, and 0 otherwise; *Leverage* is the ratio between total liabilities and total assets. *ROA* is the ratio between income before extraordinary assets and beginning total assets; *Book-to-market* is the ratio of book value of assets to the market value of equity; *Total assets (ln)* is the natural logarithm of total assets; *CFO (stand.dev)* is the standard deviation of operating cash flows computed by using rolling firm-specific three-year windows.

Chapter 5 – Conclusions

The thesis is composed of three empirical essays about corporate governance and earnings management. In the first essay, "Overinvestment, subsequent earnings management, and CEO vulnerability", results show that CEOs are likely to manipulate financial reporting information to cover investment inefficiencies through both the unexpected components of accruals and sales manipulation. Earnings management is generally more intensive if I consider investments that are more difficult to monitor, such as capital expenditures and R&D expenditures. In fact, earnings management is likely to be more effective in hiding investment inefficiencies if stakeholders cannot easily observe investment returns. Finally, results suggest that vulnerable CEOs are likely to overinvest to decrease their vulnerability in the future. Results from the second essay, titled "Entrenched managers' usage of earnings management tools", indicate that entrenchment is positively associated with income smoothing, and negatively associated with both discretionary accruals and real activities manipulation. Because entrenched CEOs engage in earnings management using methods that are less detrimental to firm value, I also show that entrenchment is positively related to subsequent operating performance. In the third essay, titled "Compensation mechanisms, accounting choice, and real activities manipulation", empirical results show that compensation mechanisms that limit CEOs' loss from stock price declines, such as stock options, lead managers to engage in accounting manipulation (i.e., income smoothing and discretionary accruals). CEOs rewarded with stock options also engage in real activities manipulation even at the expense of future cash flows, as stock options do not penalize managers as much as shareholders from a future decrease in firm value. CEOs with greater percentages of annual bonuses and long-term incentives over their total compensation engage in

discretionary accruals, rather than in real activities manipulation. In this way, they temporarily increase earnings without directly affecting future firms' value and, consequently, managerial future wealth. Equity stocks are positively associated with both income smoothing and discretionary accruals to avoid a decrease of managerial welfare from a decline in stock price without affecting long-term firm value.

Overall, the three essays have implications for both corporate governance and financial accounting literature. Although corporate governance literature observes that corporate governance mechanisms are designed to align the interests of managers to those of shareholders, authors should further consider the drawbacks of corporate governance in terms of earnings manipulation. I do not argue that corporate governance is always detrimental for firms, but that stakeholders should be careful in evaluating firms by observing corporate governance mechanisms. In fact, over the three essays, I show how corporate governance may further amplify the agency problem by leading CEOs to distort financial reporting information. For instance, managers acknowledging their vulnerability (caused by market capital pressures) may overinvest to reinforce their position and then use earnings management to mislead stakeholders. External corporate governance, such as takeovers and the market for corporate control, is typically expected to force managers to behave in the interest of shareholders. However, external corporate governance makes managers exposed to the pressure of capital markets and leads CEOs to focus on immediate results, rather than on long-term objectives, also by manipulating financial reporting information using methods that are detrimental to future firm value. Compensation mechanisms, initially considered as an incentive for managers to behave in the interest of shareholders, can lead managers to manipulate not only accounting numbers, but also normal operational activities.

My three essays have also implications for financial accounting literature. In particular, it could further explore how analysts and auditors interpret different ways that CEOs can use to manipulate financial reporting. In the three essays, I observe that income smoothing is likely to make earnings less informative, but it is also likely to have positive long-term effects on future firm value, such as a decrease in both cost of capital and cost of debt. I also report that, whilst the manipulation of accounting numbers has the main effect of reducing the quality of financial reporting information, real activities manipulation affects cash flow and, thus, future firm value. Future research could investigate whether analysts' forecasts and auditors' reports capture the methods used by CEOs to distort financial reporting information (i.e., income smoothing, discretionary accruals, and real activities manipulation), and how analysts and auditors evaluate the effects of each method.